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TRANSACTIONS
OF THE
STATE
HORTICULTURAL SOCIETY
1871.

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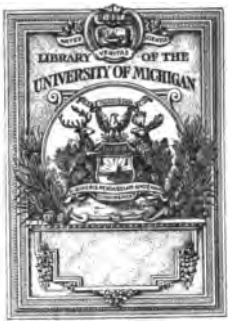
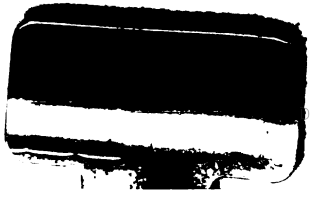


Compliments of

W. H. RAGAN,

Cor. Sec'y,

INDIANAPOLIS.



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Very Truly Yours
J. Q. Adams

ANNUAL REPORT

OF THE

INDIANA

STATE SOCIETY

[illegible], JUNE 3, 4, and 5, 1871.

REPORTS OF DISTRICT FRUIT COMMITTEE, LOCAL SOCIETIES, BOARD OF SPECIAL PREMIUMS ON ESSAYS, ETC.

INDIANAPOLIS:
R. J. BRIGHT, STATE PRINTER.
1871.

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ANNUAL REPORT

OF THE

INDIANA

STATE HORTICULTURAL SOCIETY

PROCEEDINGS OF THE

TENTH ANNUAL SESSION,

HELD AT

INDIANAPOLIS, JAN. 3, 4, and 5, 1871.

REPORTS OF DISTRICT FRUIT COMMITTEE, LOCAL SOCIETIES, BOARD OF SPECIAL PREMIUMS ON ESSAYS, ETC.

INDIANAPOLIS:
R. J. BRIGHT, STATE PRINTER.
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OFFICERS.

PRESIDENT.

DR. ALLEN FURNAS, Danville, Hendricks county.

VICE PRESIDENTS.

1ST. J. C. RATLIFF, Richmond, Wayne county.

2D. STEVEN BURNETT, Vincennes, Knox county.

3D. RAWSON VAILE, Kokomo, Howard county.

4TH. WILLIAM S. HUBBARD, Indianapolis, Marion county.

RECORDING SECRETARY.

SETH W. PEARSON, Plainfield, Hendricks county.

CORRESPONDING SECRETARY.

W. H. RAGAN, Indianapolis, Marion county.

TREASURER.

CHARLES LOWDER, Plainfield, Hendricks county.

EXECUTIVE COMMITTEE.

I. D. G. NELSON, J. T. FRANCIS, I. C. FERRIS.

DISTRICT FRUIT COMMITTEE.

1st *Dis.*—J. C. SHOEMAKER, Cannelton, Ind.		6*th* *Dis.*—JOS. GILBERT, Terre Haute, Ind.	
2d "	O. ALBERTSON, Canton, Ind.	7*th* "	—— SAMPLE, Lafayette, Ind.
3d "	I. C. FERRIS, Seymour, Ind.	8*th* "	MERCER BROWN, Kokomo, Ind.
4*th* "	J. A. MENDENHALL, Richmond, Ind.	9*th* "	D. E. HOFFMAN, Winchester, Ind.
5*th* "	W. A. RAGAN, Clayton, Ind.	10*th* "	I. D. G. NELSON, Fort Wayne, Ind.

11*th* *Dis.*—I. S. JESSUP, Laporte, Ind.

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HONORARY MEMBERS.

DR. J. A. WARDEN, Cleves, Ohio.

J. J. THOMAS, Rochester, New York.

WM. HEABER, Nashville, Tennessee.

DR. WILLIAM MATTHEWS, Mason, Illinois.

J. C. TEAS, Carthage, Missouri.

Z. S. RAGAN, Independence, Missouri.

CHARLES DOWNING, Newburg, New York.

ISAAC FURNAS, Bridgeport, Indiana.

J. C. WEINBERGER, St. Helena, California.

P. BARRY, Rochester, New York.

MRS. ANDREW WALLACE, Indianapolis, Indiana.

MISS. LAURA REAM, Indianapolis, Indiana, Correspondent Cincinnati Commercial.

C. S. MENDENHALL, Topeka, Kansas.

ROBERT MANNING, Boston, Massachusetts.

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LIST OF MEMBERS.

Rawson Vail, Kokomo, Indiana.
I. S. Jessup, Laporte, Indiana.
J. W. Billingsley, Farmer, Spring Valley, Indiana.
John T. Francis, Fruit Grower, Indianapolis, Indiana.
Henry Mankedick, Fruit Grower, Indianapolis, Indiana.
John W. Furnas, Farmer, Valley Mills, Indiana.
Seth W. Pearson, Nurseryman and Fruit Grower, Plainfield, Ind.
Tyra Montgomery, Nurseryman, Mattoon, Illinois.
William B. Pratt, Fruit Grower, Indianapolis, Indiana.
W. H. Ragan, Nurseryman and Fruit Grower, Indianapolis, Ind.
M. B. Spafford, Dixon, Illinois.
B. N. McKinstry, Nurseryman, Judson, Illinois.
L. Woodard, Nurseryman, Maringo, Illinois.
I. C. Ferris, Nurseryman and Fruit Grower, Seymour, Indiana.
Cornelius Ohaver, Fruit Grower, Danville, Indiana.
I. F. Mills, Valley Mills, Indiana.
Asher Cox, Cumberland, Indiana.
Perley Mitchel, Farmer, Bloomingdale, Indiana.
Rev. Joseph Cotton, Fruit Grower, Moore's Hill, Indiana.
Amos Alderson, Farmer, Plainfield, Indiana.
Benjamin Osburn, Fruit Grower, Indianapolis, Indiana.
J. C. Phelps, Nurseryman, Westfield, Indiana.
Daniel Cox, Farmer, Cartersburg, Indiana.
James A. Little, Fruit Grower, Cartersburg, Indiana.
J. A. Mendenhall, Fruit Grower, Richmond, Indiana.

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D. A. Fisher, Nurseryman, Mexico, Indiana.
Joseph H. Ballard, Farmer, Bridgeport, Indiana.
W. A. Ragan, Nurseryman and Fruit Grower, Clayton, Indiana.
J. C. Ratliff, Farmer, Richmond, Indiana.
W. S. Hubbard, Indianapolis, Indiana.
A. K. Williams, Richmond, Indiana.
Joseph Vestal, Florist, Cambridge City, Indiana.
Lindley M. Carter, Nurseryman, Union, Iowa.
Allen Furnas, Nurseryman and Fruit Grower, Danville, Indiana.
C. A. Ferguson, Silversmith, Indianapolis, Indiana.
John H. Nicholson, Fruit Grower, Bridgeport, Indiana.
I. P. Evans, Richmond, Indiana.
Layton Hawkins, Fruit Grower, Bridgeport, Indiana.
Ellis Larrance, Fruit Grower, Bridgeport, Indiana.
Steven Burnett, Nurseryman and Fruit Grower, Vincennes, Ind.
C. S. Boggs, Kokomo, Indiana.
E. F. Norwood, Farmer, Indianapolis, Indiana.
R. C. Duncan, Nurseryman, Portland Mills, Indiana.
Charles Lowder, Farmer and Fruit Grower, Plainfield, Indiana.
J. K. Boswell, Patentee of Fruit Dryer, Indianapolis, Indiana.
James Kersey, Jr., Farmer, Amo, Indiana.
S. B. Garigus, Farmer, Mansfield, Indiana.
Samuel Royce, Terre Haute, Indiana.
Job Davis, Farmer, Danville, Indiana.
Jesse White, Nurseryman and Fruit Grower, Plainfield, Indiana.
C. C. Olin, Indianapolis, Indiana.
Sylvester Johnson, Centerville, Indiana.
W. H. Loomis, Nurseryman, Indianapolis, Indiana.
J. S. Dunlop, Fruit Grower, Indianapolis, Indiana.
A. S. Aldue, Catlin, Indiana.
J. N. Armantrout, Frankfort, Indiana.
W. H. Dungan, Greenwood, Indiana.
Adam Jones, Nurseryman, Plainfield, Indiana.
John Morgan, Farmer, Plainfield, Indiana.
Anthony Weigand, Florist, Indianapolis, Indiana.

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C. H. Robbins, Rochester, Indiana.

Eli Carter, Farmer, New London, Indiana.

John Rodkey, Farmer, Shanghai, Indiana.

Joseph Gilbert, Fruit Grower, Terre Haute, Indiana.

John Pickard, Merchant, Bloomingdale, Indiana.

Eli Pigman, Quakertown, Indiana.

B. F. Brookland, Quakertown, Indiana.

J. M. Stanton, Quakertown, Indiana.

A. F. Davis, Liberty, Indiana.

Horace M. Bliss, Royal Center, Indiana.

Dr. G. W. McConnell, Angola, Indiana.

William Patrick, Nurseryman and Fruit Grower, Terre Haute, Indiana.

J. G. Heinl, Nurseryman and Florist, Terre Haute, Indiana.

M. C. Donnelson, Montezuma, Indiana.

Prof. E. T. Cox, Indianapolis, Indiana.

I. D. G. Nelson, Fort Wayne, Indiana.

Thomas Nelson, Bloomingdale, Indiana.

J. H. Simpson, Vincennes, Indiana.

Sidney Keith, Rochester, Indiana.

George W. Reeve, Rushville, Indiana.

Powel Howland, Indianapolis, Indiana.

J. W. Ragan, Fruit Grower, Fillmore, Indiana.

Dr. A. M. Lewis, Indianapolis, Indiana.

George W. Howard, Traders' Point, Indiana.

J. N. Miller, Bridgeport, Indiana.

B. F. Soule, Nurseryman and Fruit Grower, Terre Haute, Ind.

H. D. Scott, Terre Haute, Indiana.

Mary B. Scott, Terre Haute, Indiana.

Benajah Parker, Farmer, Raysville, Indiana.

T. C. Grooms, Greencastle, Indiana.

P. R. Stroup, Greencastle, Indiana.

W. J. Elliott, Indianapolis, Indiana.

R. E. Ragan, Fruit Grower, Independence, Missouri.

E. J. Howland, Farmer, Indianapolis, Indiana.

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Uriah Spray, Farmer, Bridgeport, Indiana.
P. W. Zent, Huntington, Indiana.
H. Caldwell, Wabash, Indiana.
William Crim, Anderson, Indiana.
Sol. Hadley, Farmer, Monrovia, Indiana.
Ira Middleton, Nurseryman and Fruit Grower, Plainfield, Ind.
John Kendall, Farmer, Amo, Indiana.
Jonathan Turley, Mitchell, Indiana.
Alvan Adams, Seymour, Indiana.
Charles Woolfork, Bedford, Indiana.
Allen Edwards, Mitchell, Indiana.
George Hammer, Mitchell, Indiana.
Jno. W. Riley, Augusta, Indiana.
L. W. Leach, Kokomo, Indiana.
James S. Collins, Columbia City, Indiana.
F. H. Foust, Columbia City, Indiana.
D. E. Hoffman, Winchester, Indiana.
F. M. Buker, Ligonier, Indiana.
R. J. Donnelly, Lake Ave. Nursery, Rochester, New York.
W. H. White, South Windsor, Connecticut.
William Fishback, Indianapolis, Indiana, (Editorial.)
D. W. Jones, Fort Wayne Press, (Editorial.)
M. G. Lee, Indianapolis Commercial, (Editorial.)
L. J. Templin, Kokomo Journal, (Editorial.)
Dr. R. T. Brown, Rural Home Visitor, (Editorial.)

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CONSTITUTION

OF THE

INDIANA HORTICULTURAL SOCIETY.

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1. This Society shall be known as the "INDIANA HORTICULTURAL SOCIETY."

2. Its officers shall consist of a President, four Vice Presidents, a Recording Secretary, a Corresponding Secretary, a Treasurer, and Executive Committee of three.

3. The President shall preside at and conduct all meetings of the Society, and in his absence, the Vice Presidents, in their order, shall perform the same duties.

4. The Recording Secretary shall record all the doings of the Society, collate and prepare all communications, etc., for the public press, and pay over all money received from members, or otherwise, to the Treasurer, on his receipt.

5. The Corresponding Secretary shall receive and answer all communications addressed to the Society; establish and maintain correspondence with all Local, County, and District Horticultural Societies, and all kindred State societies, and secure, by exchange,

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their transactions, as far as possible; to aid the President as an executive officer in the dispatch of business relating to meetings of the Society — preparing and publishing circulars of the Society, and notices of horticultural and similar meetings of general interest; and report to the annual meeting of the Society an abstract of the matter that has come into his possession, which, with its approval, shall become, in the hands of the Recording Secretary, a part of the transactions of the current year; and assist the Recording Secretary during meetings of the Society.

6. The Treasurer shall collect and hold all funds of the Society, and pay out the same only on an order from the Secretary, countersigned by the President.

7. The officers shall be elected separately and annually, by a ballot vote, and hold their office until their successors are elected.

8. The object of the Society being to collect, condense, and collate information relative to all varieties of fruit, and dispense the same among the people, every member shall pay into the treasury $1.00 a year for the purpose of publishing and other expenses. Any person interested in fruits may become a member by forwarding to the Treasurer or Secretary the membership fee.

9. Every member shall be entitled to a copy of the transactions of the Society, as often as the same shall be published by order of the Society.

10. The President and Secretaries of the Society may call a meeting of the Society, at any time and place they may consider advisable, by a notice of thirty days in the public papers.

11. The President, at each annual meeting of the Society, shall appoint a General Fruit Committee, consisting of one member from each Congressional District in the State, and it shall be the duty of each member to report upon the fruit crop in his respective district. And it shall be the duty of said Committee to report annually a limited list of fruits best adapted to general cultivation for the State at

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large, and also lists adapted for cultivation north and south of the National road.

12. By-Laws and alterations in the Constitution, for the purpose of governing further wants of the Society, may be enacted by a majority of the members present at a regular meeting.

13. The Society shall hold annual sessions in the city of Indianapolis, on the first Tnesday after the first Monday in January; and other meetings at such times and places as the Society may direct. It shall be the duty of the Executive Committee to procure rooms, and make all necessary arrangements for the holding of the meetings of the Society; to make out a programme of business for each meeting, and attend to such other duties as the Society may from time to time direct.

14. The officers of this Society, together with the Fruit Committee, shall constitute a Board of Horticulture, five of whom shall constitute a quorum for the transaction of business, the officers of the Society to be officers of the Board; said Board to meet immediately on the adjournment of the Society, and, afterwards, on their own adjournment, it shall be the duty of the Board of Horticulture to collect horticultural information; and they shall be authorized to employ an agent or agents to visit different portions of our State or adjoining States, to collect horticultural information of general interest, and shall be authorized to draw on the Treasurer for means to pay the expenses of said agents when there is in the treasury means not otherwise needed. And said Board shall make full and definite reports of their proceedings, with all horticultural information collected, to the regular meetings of the Society.

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PROCEEDINGS

OF THE

TENTH ANNUAL SESSION

OF THE

INDIANA HORTICULTURAL SOCIETY.

FIRST DAY.

The tenth annual session of the Indiana Horticultural Society met at the Board of Trade Rooms, in the city of Indianapolis, January 3d, 1871, at ten o'clock A. M.

An informal meeting was held, fruits arranged on the tables, and other preliminary arrangements for the meeting, when the Society adjourned to half-past one o'clock P. M.

AFTERNON—FIRST DAY.

Dr. A. Furnas in the chair.

The President read his annual address, as follows:

Gentlemen—Members of the Indiana State Horticultural Society:

Again we are spared to meet and mingle at our annual gathering around the altar of Pomania; and it is with feelings of devout thankfulness that we are enabled to extend to each other the right hand of fellowship in the noble work in which we are engaged.

Though timely rains may have been withheld, and a prolonged drouth cut short some of our crops, while insects attacked the remainder, yet the past season has not been without instruction, or the result wholly devoid of profit.

He who runs may read, and he who cultivates his orchard or vineyard is unworthy

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the name of an Indiana Fruitgrower, if he does not treasure up in his mind the facts and experience of the past as a never-failing fund to be brought in requisition in every time of need. The intelligent Horticulturalist is not a mere passive automatom whose highest ambition is to exist without an effort; live without an aim, or succeed without the light of science or experience of others. On the contrary, the energetic Fruitgrower must be alive to the improvements that are constantly going on around him, avail himself of the experience of others, bring science to his aid in reading the great book of nature, and thus explain the wonderful phenomenon that is constantly transpiring within the line of his observation.

It is for these several purposes that we are here to-day—to unite our observations in one common stock, not only for the benefit of each individual member of this Board, but also that our teachings may be disseminated broadcast to every citizen of our State.

The origin and past history of the feeble efforts of our Society discover nothing remarkable, yet it is cheering to its friends to witness its gradual growth in usefulness, as every year has showed a step in advance of those that have gone before. It is to be hoped that those that have had the management of this Society heretofore, as well as those to whom it may be intrusted in the future, will always on all occasions feel the responsibility of presiding over so great an interest.

It is indeed with feelings of no ordinary kind that we look forward to the perfection to which the art of horticulture is inevitably destined to attain, as well as the prominence which it must assume in furnishing sustenance to our rapidly increasing population.

Indiana, possessed of a varied soil, from the richest to the most sterile, from the level plain with its alluvial deposits, through the beautiful rolling undulations of our woodland and prairies up to where the surface is furrowed and ridged in deep and dark ravines, alternating with bold and everlasting hills, is thus eminently fitted to produce almost any and everything that will grow in the temperate zone.

A new era is dawning upon our State, and he who estimates its future by the past will fall far short of a correct conclusion as to its ultimate destiny. The mineral wealth of Indiana, together with her almost inexhaustible coal mines, are just now developing a new industry in her southern and western border. Eastern capital is brought here to develop our mineral wealth, and with this comes the miner, the mechanic, and the manufacturer. All these must be fed, thus opening up a market for fruits and vegetables heretofore unknown among us. To this add the population in our numerous cities and towns and the whole forms an army of non-producers, but *consumers* of no mean consequence. The building up of manufactories among us will result in turning or diverting labor from the field to the workshop, and in exact ratio as consumers are multiplied in our midst, correspondingly will the producer find a remunerative demand for the products of his soil and labor. As fruit trees are not the growth of a season or a year, the intelligent fruit grower, entertaining these views of the relative condition of supply and demand, will at once begin the work of budding, grafting, planting, cultivating and pruning, in order that when the good time does come, he may find himself in readiness to reap his reward.

THE BLIGHT.

Not pretending to give proper names or remedies for the blight that appeared simultaneously in the apple and pear early in the past season, yet I thought a few remarks, by way of calling your attention to the circumstance itself, the manner of its attack and the predisposing causes which may have conspired to have induced it

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as worthy the serious and careful deliberation of this body. It will be remembered that in this city, and but a few rods from this hall, the theory of "frozen sap" was first broached by Henry Ward Beecher, to account for pear blight. For a long period of years this disease has been almost wholly unknown among us, so much so, at least, that on its reappearance it was difficult to arouse the public mind to a sense of the imminent danger that threatened the destruction of our trees.

Every nurseryman in Indiana will long remember the disastrous results of a premature freeze that occurred on the night succeeding the 25th of October, 1869. If there is nothing in the frozen sap theory, it is at least rather a singular coincidence that pear blight should immediately succeed so severe a frost, as neither blight nor a similar cold snap had occurred for long years before. It is a remarkable fact, that simultaneously with the attack of the pear the apple tree was also affected, and the query naturally arises, whether the same cause did not induce the trouble in both? If one season's growth is sufficient to eradicate all traces of this disease, and admitting that it was the result of frozen sap, then next year we should claim exemption from it, for never with us was wood, twig and bud better matured than at this time.

NOMENCLATURE.

We have indulged in a good share of self-congratulation respecting our progress in correct nomenclature of fruits. That we are justly entitled to do so no one should doubt. Much, however, remains to be accomplished in this direction. Our success in this field of labor will always be comparative; for while our experienced pomologists are passing off the stage of action, new beginners are coming forward who must necessarily tread the same path—learn the same lessons; and thus it is that this work is never finished. Too much care, however, can not be had in this matter; for, with a correct nomenclature, much perplexity and confusion would be avoided, as well as consequent unnecessary expense incurred. I always feel the greatest respect for other men's opinions; and when a man fails to point out the difference between a Janet and Neverfail so as to make it tangible to my comprehension, and pities me for my obtuseness, I admire his disinterested honesty and good intention more than I do his horticultural lore. Or when the "Rhode Island Piniken" is ordered from my list of apples, I enter a plea of extenuation, for want of a full list of market varieties.

Should some enthusiastic gentleman present me with a basket of handsome *red stripes*, and claim them as a seedling of his own, originated in New Jersey, and I fail to trace in the lineaments of either the relation between *parent and offspring*, I claim exemption from censure, as I never made any proficiency in the niceties of relative physiognomy.

DESTRUCTIVE INSECTS.

That insects destructive to fruit, especially the apple, are rapidly on the increase must be apparent to all, but how to rid our orchards of them does not appear so clear to any one. The great question for us to decide is how to most successfully combat this host of enemies to fruit growing; or, perhaps, the first question we should ask ourselves should be, "Is it possible to do anything to remedy this rapidly increasing evil?" If we decide "in the affirmative," then anything and everything that will destroy a depredator in any shape is in order.

I would call your attention to the fact that Legislative aid has been brought in requisition in several of the States, in order to check this great hindrance to the

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production of fruit. Every cultivator of the apple in Indiana must be apprised of the fact that from *pestiferous* insects, comes more trouble in this important fruit than all other causes combined. Hence, if anything can be done to stay the ravages of this army of destroyers, we should at once avail ourselves of it. My own advice in the matter would be to at once set the entomologist at work, on a salary that will enable him to give his whole attention to this interest alone; and before the close of this meeting I hope that measures may be taken by it to urge the importance of creating the office of Entomologist before our ensuing Legislature. If an office thus created by law, somewhat similar in its expenditures to that of the State Geologist, should effect a saving of one quarter of one per cent. on the damage incurred from noxious insects, it would pay a large per cent. on the investment. In consideration of our extremity in the matter, $2,000 annually for the next two years appropriated for this purpose would not be felt by our State, now said to be free from debt, and if the experiment is not satisfactory it can be discontinued. Enough has been said in these brief hints, and this meeting will take such steps as it may deem prudent in the matter.

ADDITIONAL APPROPRIATIONS.

While on the subject of appropriations I wish to call your attention to the inadequacy of the present appropriation for the publication of our annual reports. As our Society grows in importance and usefulness, the labor of our recording and corresponding secretaries require more time and attention in the fulfillment of these offices respectively, and for such time and talent some sort of remuneration should be given in return. For this purpose, and the other incidentals necessarily connected with our annual meetings, such as advertising, stationery, etc., more money will be required in the future than has heretofore been received for initiation fees. We should, therefore, have the appropriation paid directly into the hands of the executive officers, and for such money received make it the duty of these officers to report to the Legislature or Governor, in which every dollar shall be accounted for.

For these and such other subjects as may require legislative action in promoting the cause of Horticulture generally, I would suggest the propriety of appointing a judicious committee, whose duty it shall be to memorialize the Legislature on the various subjects that this Society may direct.

CHANGE OF PLACE OF MEETING.

It will be remembered by the first workers in this society that the lamented George M. Beeler was in favor of holding our annual meetings in different parts of the State, changing from one place to another as opportunity offered, thus diffusing the benefits to be derived from these meetings, as well as enlisting in the Horticultural enterprise more of the fruit growers of Indiana. The success of this system has worked satisfactorily in neighboring States, and I would most respectfully suggest that this meeting take the matter under consideration, and if thought best, make the experiment for at least one session, and if the result is not satisfactory, we can return to Indianapolis again, as it is the great railroad center of the State.

I can not close these remarks without briefly alluding to the aid and encouragement we have received from several of the leading railroads centering here. A year ago the managers of the Terre Haute road set the precedent by returning the members of this Society free, on the certificate of our Corresponding Secretary. And this year, on calling upon the gentlemanly Assistant Superintendent, Colonel

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Simpson, of this place, for like favors, he answered that he would have to send to Terre Haute and consult the principal Superintendent.

This he did by telegraph, and in a few minutes we were assured of the granting of our request. Last summer, in an official visit to Terre Haute, General T. A. Morris, President of the Indianapolis and St. Louis road, placed the officers of this Society under lasting obligations by issuing passes over the road for the round trip. And again at this time he cheerfully returns members over his road free.

Our friend Macy, of the Peru road, also places us under like obligations by returning our members over that road, while the Indianapolis, Bloomington and Western road returns at one-fifth the usual rate.

DEATHS.

A few deaths have occurred among our members, the particulars of which I am not sufficiently advised. I would therefore suggest the propriety of appointing a committee to extend the necessary notice of deceased members.

ROTATION IN OFFICE.

One other subject and I will close, and that is the policy of the *one term system*, for our presiding officer, believing that it may be productive of good by eliciting more interest as well as talent, and, further, since the innovation on the previous usage governing this society in this matter was made a year ago, I would most respectfully recommend it for *further trial.*

On motion the Society proceeded to the election of officers for the ensuing year, which resulted as follows:

President—Dr. A. Furnas, Danville.

Vice Presidents—J. C. Ratliff, Richmond; Steven Burnett, Vincennes; Rawson Vaile, Kokomo, and William S. Hubbard, Indianapolis.

Recording Secretary—Seth W. Pearson, Plainfield.

Corresponding Secretary—W. H. Ragan, Indianapolis.

Treasurer—Charles Lowder, Plainfield.

Executive Committee—I. D. G. Nelson, Fort Wayne; J. T. Francis, Indianapolis, and I. C. Ferris, Seymour.

On motion the following committees were appointed:

On President's Address—W. H. Ragan, J. C. Ratliff, and Joseph Gilbert.

On Finance—J. C. Ratliff, Alfred Williams, and C. Ohaver.

On Premium Essays—J. T. Francis, W. A. Ragan, and W. H. Ragan.

On Constitution—Seth W. Pearson, Joseph Gilbert, W. A. Ragan, J. A. Mendenhall, and Joseph Cotton.

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The appointment of these committees was followed by discussion on "*The extent to which our fruit is injured by the cold weather,*" which was opened by J. C. Ratliff, of Richmond. He said he had examined his peach trees, and found the buds nearly all killed. The thermometer showed 12° below zero in that neighborhood. So far as he has heard, the effect has been the same. He thinks at least four-fifths of the buds are killed.

J. Cotton, of Moore's Hill, stated that Mr. Willey, who has twenty thousand bearing peach trees, had remarked, a short time since, that he will not have *any* peaches. These orchards are on the knobs of Clarke county. Thermometer stood at 11° below, at half-past five o'clock, on Sunday morning.

Dr. A. Furnas inquired of the speaker, what was the condition of the buds, and the ripening of the wood with you?

J. Cotton.—The buds were considerably advanced, and the wood tender. The fore part of the season was calculated to swell the buds and put forward the germs very much—more so, than usual. As far as I have examined, I have not found a living germ, and my observations have been quite extensive, both on cultivated varieties and seedlings.

Joseph Gilbert, of Terre Haute.—The thermometer was at 13° below zero with us. The peaches are *probably* killed. I have not sufficient information to say that they are all killed. The buds were dry at the time the freeze came on. I think this is in their favor.

J. Cotton said, Mr. Willey thinks *his* cherries and plums are killed.

Dr. R. T. Brown.—We, here, marked about 12½°, on correct thermometers; some gave marks lower than that, but that was about correct—12° to 13°, owing to the exposure. The actual sink of the thermometer did not reach lower, on any exposure, than 13° below. Mine hung on a heavy brick wall. The cold was so sudden that the wall did not get cooled down to that temperature by about one degree. The wood of the peach trees in my garden, was well matured in the fall; the leaves fell off, having ripened without being injured by the frost at all; the wood appeared to be ripe, but the warm days in November and the early part of December, had very sensibly enlarged the buds. I have made considerable search, but have not yet found a living bud, though there may be some. I have seen

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no tendency, with the warm days that we have had since, to blacken under the bark. Such days as last Sunday, or such an afternoon as this, ought to give a black appearance under the bark, if the wood is injured. I have examined my cherries, and report myself "not satisfied." We can not determine so soon, because they are slower in showing the effect. My cherry buds were not so much advanced with the warm weather as the peach buds were. I can not determine certainly, whether they are killed or not. Some show as though they were; others, do not show any sign of it. I incline to the belief that I shall have some cherries, if nothing befalls them hereafter. I have made two excursions to the country since the freeze, and wherever I found a peach tree, by the road side, or in orchards, I examined the buds. I have nowhere found living buds.

S. BURNETT, of Vincennes.—I did not take particular notice of my peach trees before leaving home. The mercury sunk near 5° below zero. The buds were dry, the wood well matured, and the leaves had ripened and fallen off before there was any frost at all. My judgment would be, that they are not killed. I have not heard of any being killed in that locality. I think they do not kill easily with the mercury higher than 10° or 12° below zero.

DR. FURNAS.—John J. Thomas says that under the most favorable conditions, peaches will stand the cold as low as 12° below zero. I never saw the wood in better fix in my life; the terminal buds will do to graft now. I think my peaches are dead. Mercury was 17° below zero. My thermometer has been compared with many others, and is found to show about an average of them. It hangs on the north side of my house, where there is no fire.

W. H. RAGAN.—I have heard from the peach region of Jackson county, through I. C. Ferris, of Chestnut Ridge, who says that the mercury was down to 9° below zero, and that the peaches are not killed.

W. A. RAGAN, of Clayton.—When the mercury comes below 12°, we need not expect to find living peach buds. My thermometer went down to nearly 15°, in a position in which it was protected from any wind, though many in town went down to 18°. I did not think it necessary to examine the peach buds.

The early May cherry, under favorable circumstances, is seldom killed in this country. The buds have not all been killed at any

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time in twenty-five years. We have not failed to have a fair crop of May cherries more than once or twice in that time.

As regards the wood: It was in good condition. The buds were enlarged from the warm weather, and were more easily killed than they would have been under other circumstances. You will find that the wood is a little darkened just below the bud, but I think this will not injure the tree.

DR. R. T. BROWN.—The *time* when peaches are killed is an interesting subject. I do not remember *when* they were killed in a great many years, but I recollect that in 1855 they were killed on the 25th of December. In the cold winter of '55 and '56, the thermometer fell to 20° below zero on Christmas night, and did not get much above zero till the end of January. It never thawed in the shade from the 24th of December till the 22d of February, and then only for two hours, after which it resumed its former temperature, and remained so till the 10th of March; but the mischief was done on Christmas night. The fall following that, we had no peaches to kill, because the winter finished our trees in Indiana, at least north of the National road. No trees, that I saw, survived that winter, and if there had been any, they would have been killed on the 17th of November. I recollect how the corn rotted in the crib, though it appeared to be ripe at the time. On the 1st of January, '64, we had all our peaches killed. Many trees and grape vines were killed at the same time. On New Year's day the thermometer ran down to 20° below zero at this point. There is one thing remarkable about the cold spell we have just had, as gathered from the telegraphic reports. There is not much reliability in many thermometers, but when there is a standard, we may rely on it pretty well. All our thermometers vary very much in marking the temperature, but, making allowance for variations, there has been a singular manifestation in this cold spell. The cold wave seems to have had a sharp southeasterly bearing. It came from the northwest; its progress was towards the southwest. It struck us here on Wednesday. Tuesday night was the first that was real cold. On Monday there was rain and snow, but it was not cold. Tuesday it began to get cold in the afternoon, and towards night it was quite cold here. But the telegraph tells us that in certain places the thermometer was down to zero, while it was thawing here. At St. Louis the thermometer was at zero by midnight. On Monday night a dispatch from Denver City and Cheyenne states that it was 16° below zero on Friday before. So we can note the progress

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of it. It advanced nearly at the rate of a rapid railroad car. It had a very definite margin to the southwest. At Terre Haute, on the Wabash, the thermometer marked 11° or 12° below zero. Just below it a short distance is Vincennes, where the marking was but 5° below zero. We find the same difference between Bloomington, which marked down to 10°, or at least 9°, below zero, and Louisville, where it was only 4° or 5°. The same result extended all along this line. The thermometer did not reach zero at all at Cairo. It did not reach zero at all along south of Louisville. At Lexington it was down to within four or five degrees of zero. It was colder at Chicago than it was at Grand Rapids, in Michigan. It was as cold at Rock Island as it was at St. Paul. So you may regard the wave as extending from Detroit to a point some forty or fifty miles south of Indianapolis. The center of the wave was probably a little this side of Laporte. It went eastward to the Alleghanies. It swept over Ohio with little diminution. At Richmond the mercury was at 10° below zero. Columbus gives nearly the same marking. At Cleveland it only drops to 10° below, while at some points, about Mansfield, in Ohio, it comes down to 12° again. At the Alleghanies its influence seems to have been broken.

The study of these cold waves and storms is a very interesting and important one, and the telegraph gives us an opportunity to read very intelligently the progress and dimensions of this wave. It came down from the summit of the Rocky Mountains to the plains, and rolled across until it struck the Alleghanies, and there broke its force.

Layton Hawkins.—I know of one tree that was an exception to the statement of Dr. Brown, that the trees were all killed in the winter of '56. In digging a well the earth was thrown around the root of that tree. It was not injured, but made a healthy growth the next and following seasons, till the cold snap of '64, when it was killed.

Dr. Brown.—I think we may set it down that Indiana will have no peaches north of the line I have indicated.

J. Cotton.—An interesting fact occurred on the farm of Mr. Atherton. His son planted, I think, about two hundred peach trees a short time before he went into the army. He planted them nearly a foot deeper than the usual method of planting. While nearly all the trees in that vicinity were killed, those trees were preserved;

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they stood that cold winter, and came out all in good health. There must be something in the depth of planting.

T. BUSHONG.—I banked up the earth to a considerable depth around some trees, at Lafayette, five years ago, and they have borne fruit ever since.

W. A. RAGAN asked if filling up around the tree retards its putting out in the spring?

An affirmative answer was given by two or three persons. It was also stated that the same process tends to check the growth of the tree, making it less vigorous.

W. A. RAGAN added that on the stiff, cold land of New York peach trees will bear if the mercury falls fifteen or sixteen degrees below zero, while ours will not endure more than twelve.

S. BURNETT called attention to the manner of pruning trees that are injured by the frost: My experience, in '56, was to let them alone, though the bark was blackened and cracked in some cases, and split so that the trees partially died. The next year we had a tolerably fair crop of fruit from the trees that were apparently dead from the frost. The following season they were injured in the same way. I cut part of my trees down to the ground, with the expectation that they would sprout up again. I cut off the limbs of a part of them as high as I could reach with an ax. The others were left untouched. Those that were left without pruning at all produced a partial crop of fruit the succeeding year. Those that were cut off entirely showed no signs of sprouting. Those that were cut off as high as I could reach did no good to amount to anything. A neighbor of mine had four hundred very promising trees, four years old. He sawed them off near the ground, except some of the trees in two rows, which were left untouched. Next year those two rows bore a full crop. Those that were sawed off died entirely. Our experience is that it is better to let them entirely alone. We see it stated in horticultural papers that when they are injured in that way, the sooner they are cut off the better. I think it is better to let them alone.

AMOS ALDERSON.—The same year that the trees were killed down entirely, I cut mine off at the ground, and now I have, in my orchard, large living trees from the same roots, which are in good bearing. I left one tree, and it is now worthless. The trees were

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three years old, and were cut down in the "new of the moon," in March.

T. BUSHONG.—An acquaintance of mine, for whom I was working, had a large number of trees. He ordered me to saw them all off. Snow was on the ground at the time, and we had to throw it away from the root of the trees. We cut all off close to the ground, except about a dozen that stood around the fence. In three years they had peaches, while the others had none.

DR. FURNAS.—I think the matter may be easily explained. Our friend from Vincennes being further south, his trees were not so badly damaged, and should not have been cut down.

E. J. HOWLAND.—The same year they speak of, I had two rows of trees, five years old. I cut all of them down, except two, about the last of April. They sprouted, grew up, and have been bearing pretty well since. Those that were left standing, have been bearing fruit ever since, and show no apparant effects of that hard winter.

Report, read by W. H. Ragan.

NOTES ON FRUITS OF THE PAST SEASON.

Mr. President, and gentlemen of Indiana Horticultural Society:

As it is by experience, both of our own, and that of others, who are willing to communicate to us the results of their labors, that we learn any art most thoroughly, and wishing to contribute a morsel to the advancement of horticulture, I have selected the above subject as one likely to be of interest to some, especially to those wishing to plant fruit trees, plants, and vines, the coming spring. The past season has been of a peculiar character, the result of which has been to change many of our previous opinions in regard to the value of many varieties of fruits—many, that heretofore did well, failing, while others that rarely succeed, have given us very satisfactory results. These annual variations of failure and success, with varieties, is constantly going on, and it is this cause, more than any other, that misleads new beginners (and old ones, sometimes,) in their selections of fruits for planting. They see some variety doing finely, or poorly, and they get, or reject it, while, perhaps, the experience of another year would entirely change their opinions and their choice.

As the strawberry comes first in season, we will first speak of it, but will take the liberty of extending our observations back over the two last seasons. We do this, because of the great dissimilarity in the two years; one very wet, the other extremely dry; one very favorable, the other most unfavorable to the growth of this fruit. In 1869, we had about twenty-five varieties in fruiting, most all of which did well; and had we not known the faults of many of them, we might have been induced to plant and recommend the Jucunda, Russell, Austin, French's Seedling, Triomph de' Gand, Brooklyn Scarlet, Fillmore, Dr. Niceas, Ripewam, Lenning's White, Victoria, Agriculturalist, and, perhaps, some others; some of which were magnificent, and all very fine; but with better culture and finer plants, the results of 1870 have caused us to discard all these as unworthy of further trial, and strength-

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ened our previously favorable opinion of Nicanor for early, Green Prolific for late, and Wilson's Albany for all the time. We can yet hope that these sorts may be improved upon, but have great fears that our hope may not be realized, especially with regard to Wilson's Albany.

We cultivate in hills, mulching with straw, and consider this the only successful and reliable mode of culture. Others differ with us in this opinion; but the result of a dry season, like the past, could not fail to convince the most incredulous in favor of this system. While many of our neighbors, who in 1869, with their broadcast culture, had fine crops, almost, or quite as fine as ours, in 1870 made an entire failure, even with the Wilson, ours the latter season yielded at the rate of one hundred bushels to the acre of the very finest fruit. This was due to the mulching, keeping the ground cool and moist. While that unmulched was drying up the plants, and ripening the fruit prematurely, ours was held back until, fortunately for us, on the 10th of June, we had a fine shower, which, while too late to save others, brought ours out magnificently.

The summer showers came on in time to save our raspberry crop. In addition to our old sorts, such as Philadelphia, Doolittle, and several varieties of Red Antwerps, all of which were fine, we have fruited the Davidson's Thornless, a black cap, which we think deserving of much praise; and the Clarke, which is in quality equal to any of the Antwerps, and has the merit of hardihood, which is lacking in all the finer foreign sorts.

The currant crop was short, as was also the gooseberry. The varieties of the former most approved, are Cherry and White Grape, for market, and Long Bunch Red for home use. Of gooseberries, we have only one sort that we can give a general recommendation: that is the Houghton Seedling.

We have tried for several years, to succeed with Lawton and Wilson's Early Blackberries, but find the former too tender, and the latter not fruitful; while in the Kittatinny we have found not only hardihood and fruitfulness combined, but quality unsurpassed by any other. To those who wish to have blackberries, regardless of cold winters, we would recommend the Kittatinny.

We come now to speak of the grape, of which we have in bearing over forty varieties, nearly all of which did well in 1870, and very poorly in 1869. The same causes which were favorable to the strawberry in the one season, and unfavorable the other, were reversed in their effects on the grape; too much moisture being productive of disease, while a dry season favored the ripening and perfection of the grape. In 1869, the sorts free from disease, were Israella, Venango and Ives, while even the Concord and Clinton rotted somewhat. In 1870 we note Hartford Prolific ripe, and sent to market on August 12th, with Ives on the 17th. We received twenty-five cents per pound for these in consequence of their earliness, while the Concord, much finer than either, only brought from ten to fifteen cents. The Ives fully sustains its reputation for fruitfulness and freedom from disease, while its earliness will give it a good market value, to say nothing of its reputed value as a wine grape. We have fruited several of Rodgers' Hybrids, and think very well of some of them. They are almost all good, vigorous growers, free from mildew, or leaf-blight, and I think quite hardy.

The two that we think most of, are the Wilder and Salem. The Wilder is a large black grape, very much resembling the Concord, but so much better, that some of each taken to market on the same day, sold for fifteen and twenty-five cents, respectively. The Salem is a chestnut-brown grape, of large size, and in quality, the very best, almost or quite superior to the Delaware, with a much better vine and foliage.

These varieties have not had sufficient trial to warrant us in recommending them

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for general cultivation, but we do not hesitate to say that they are worthy of further trial. We have no other new varieties which we can say so much for. If we were called upon for a select list, we should say, Hartford Prolific, Ives, Concord, Delaware, and Clinton, and Wilder and Salem for further trial.

Our peach crop was a failure, and so of the apple. The causes were, doubtless, the effects of the April cold snap, and the result of insect depredations—the curculio and codling moth playing a prominent part. We hope that our discussions on entomology may develop some remedy for these growing pests. The pear crop was good, considering the age of our trees, the oldest of which were planted in the fall of 1864, and although mostly standards, we have had three paying crops of fruit. As yet we have had no blight, except in some varieties, that species of blight effecting the leaf only, which is injurious, but not always fatal to the tree. We regard our location for pear growing, a good one, and our success as highly satisfactory.

The varieties that have done well, or, I might say, magnificently, are Bartlett, Howell, Doyenne Boussock, Flemish Beauty, Beurre Clairgeau, Onondaga, Urbaniste, Sheldon, Belle Lucrative, Beurre d' Anjou, Seckel Lawrence, Glout Morceau, and Vicar of Winkfield. We have fruited many other varieties, some of which have proved very satisfactory, but with our present experience, would plant most largely of the above varieties. The more we know of dwarfs, the less we would recommend and plant them. People expect to get fruit earlier from them, while our observations are, that with many varieties, the standards give us the first, generally the best, and always the most fruit, while the trees are, as a friend remarked, in admiring some of our fine standards, worthy of cultivation as ornamental, if they were not fruit-bearing trees.

Altogether, the fruit crop of 1870, may be regarded as a poor one; but we don't feel discouraged with the result, and hope to be profited by the lesson.

DISCUSSION.

R. VAILE, of Kokomo.—The Clinton is with us a failure, in consequence of being a prey to some insect, perhaps, the grape louse. You find protuberances on the under side of the leaf which contain a large number of eggs. These hatch out, and in a short time destroy the leaf. Some of the younger plants bear pretty well, but the old ones do not. The trouble is common to this variety in my locality. It does not effect the Concord. I have seen a few upon the Hartford Prolific. The Delaware is effected a little, but not much. The Rebecca considerably.

S. W. PEARSON.—For my part, I would strike the Clinton from the list. I think the Dorr Seedling is far superior.

J. COTTON.—The Clinton, with us, up to last year, succeeded. Last year it was not successful. It had the same difficulty of which

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my friend speaks; it seemed to be peculiar to that variety. However, we noticed it, to some extent, on a few other kinds. We are very much pleased with the Martha. It was introduced three years ago. Last season we had considerable fruit. It was unanimously approved by our best men. I have nothing equal to it as a grower.

W. H. RAGAN.—In regard to this difficulty that has been mentioned, I have been acquainted with it for a number of years. It is a gall insect. Like the rest of the family of gall insects, it makes a little puncture on the under side of the leaf, and deposits its eggs there. As they hatch out, the plant builds a house around them, as we see in the case of the gall on the elm, and some other trees. It is not peculiar to the Clinton by any means, though this has suffered more from it than other varieties. It is peculiar to that class of smooth-leaved varieties. The Delaware is affected almost as bad. I have never met with it on the downy-leaved varieties. I do not know any remedy for it. The Clinton needs more latitude than most of us give it, and if you attempt to prune it down to the short system, it becomes impatient of such treatment, and scarcely ever does well, unless it has trellis room. There is nothing that I like better than a well ripened Clinton, yet it is true that many of them are poor. A large proportion of those on a single vine, or the entire crop on poor vines, will be almost worthless, owing to this trouble with the leaf. I have not known the Clinton to drop its fruit.

T. MONTGOMERY, of Mattoon, Ill.—I have found a great difference in the Clinton, owing to the situation. When running on the trellis, or on the walls, and under the eaves of the house, they are very good. They appear to be ripe before they are ripe. I think locality has much to do with the success of the Clinton. It will not do to trim it down to the vineyard system. Where shade is wanted, it is excellent, and it gives us grapes after most of the other grapes are gone.

W. A. RAGAN.—We should not be too hasty in passing judgment upon these varieties. Friend Pearson has made a suggestion to strike it from the list. I rise to defend it. We should not pass judgment on a grape by one single locality or experiment. I have had the Clinton ever since it was introduced, and I have had none that has given so universal satisfaction as it has done, the Concord excepted. It is a rapid grower. This is one reason why insects harbor there. It wants to run out where the sun can meet it and it can have air, so

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as not to form hiding-places for insects. I have two vines that have been allowed to run as far as they wanted to, and I gather grapes from these vines after the others are gone. You want to let them get thoroughly ripe. No grape has a better juice. It is not so good as the Delaware, but when your other grapes are gone, you will eat it. I do not feel that we can do without it. It comes the nearest to the wild grape of anything we have. It comes nearer bearing grapes without any work and culture than any other of the fine grapes we can raise. I would not discard it from the list. When young, it will bear well with the common way of training, but when strong, it will shade down its fruit, and not do so well.

S. W. PEARSON.—The Clinton has never done any good with me.

ADAM JONES.—I have raised the Clinton for several years, and like it better every year. This year part of one vine was running up a peach tree, and it bore the best grapes, because they had the most room.

J. W. FURNAS inquired as to the hardihood of the Clinton. In trimming the wood, this fall, he found the ends of the vines of this variety damaged more than any other kinds.

In answer to his question it was stated that the Clinton is as hardy as the wild grape.

It was suggested that probably he did not trim any in the summer, and that this is the cause of the injury to the wood.

DR. A. FURNAS.—It is a fact that the Clinton will produce more dead wood than any other grape that I know of. I like the Dorr very well myself, but I could not dispense with the Clinton. It succeeds measurably well. I make more money from the Concord than from anything else. If the weather is a little wet, and the vines a little overloaded, you will probably get little good fruit from the Clinton.

J. W. FURNAS.—I would like some information on the Clarke raspberry, as to the shipping qualities of the berry.

W. H. RAGAN.—It can not be shipped. It is as soft as the Philadelphia; more so, perhaps. It is more like the Antwerps. It can be carried eight or ten miles, I suppose, without difficulty. It seems to be hardy; it has not been killed with me. The October cold spell, last winter, killed the Philadelphia, injured the Clarke, but did not hurt the Antwerps, owing to the condition of growth at the time;

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the Clarke and Philadelphia were growing while the Antwerps were matured.

DR. FURNAS.—Taken into consideration with the Philadelphia, how is it for productiveness?

W. H. RAGAN.—We have not had it yield so largely as the Philadelphia, from the fact that we have been propagating the Clarke to such an extent as to injure its bearing, but it is a magnificent berry. I think, with proper culture, it will give a good crop, and will be worth double per gallon what the Philadelphia is.

J. W. FURNAS.—We find that the older the Philadelphia plantations become, the more easily they are killed, while the newer ones do not kill so easily.

LAYTON HAWKINS.—I have formed the same opinion; the older plantations kill more easily.

W. A. RAGAN.—The report speaks of the Lawton blackberry as not being hardy. The Lawton blackberry, the Concord grape, and the Wilson's Albany strawberry have succeeded as well with me as any fruits we have in this country. The Lawton may not succeed well under a high state of cultivation; it may have too rank a growth, and be killed from that cause. Some years when the peach trees are killed, we even find the briars of the Lawton, though unprotected, coming through the winter uninjured. Some years we fail to raise a crop of our best kinds of fruit. We fail sometimes with the Concord, yet we do not discard it. Some of the members of this society visited Terre Haute, last summer, and found the Lawton blackberry, in the grounds of friend Pegg, bearing to perfection, giving a profit of nearly two hundred dollars per acre. It is a good thing. I find it so, generally. I have realized more fruit from the Lawton blackberry than from anything I have ever planted, the Wilson's Albany strawberry not excepted. It lasts so long is one good feature; it lasts from six weeks to two months. It sells readily for a good price when the common blackberry will hardly sell at all. No family should be without the Lawton blackberry. A small patch in the garden will furnish plenty of berries for the use of a family. I think the Society should recommend its cultivation. It would rather have cold, flat land, where it grows to the greatest perfection; but it does well on almost any soil, except under this high state of cultivation; the bushes will not bear it. Those we saw at Terre Haute were not mulched.

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S. W. PEARSON.—My experience with the Philadelphia raspberry is that it does not do well on a stiff, clay soil; the soil should be loose and rich. I had them on soil of both kinds last year, and those on the loose soil did best. They were well mulched.

ALFRED BELCHAM, of Raysville.—The Philadelphia will not do any good on a rich, black soil, but give it a tough, beech clay, and it will do better than any other.

J. COTTON.—From forty hills we gathered upwards of forty gallons of good berries of the Philadelphia. The soil was clay of medium character; not very rich, and not poor. I plowed it well in the fall with the "bull tongue," and planted in rows twelve feet apart, and the hills four and a half feet in the rows. I plowed them well in the fall, and mulched heavily. I pruned them back to about two and a half feet, and pinched them back in the summer; pruned them in November, and a better crop of fruit I never saw. I presented our Society with a few gallons, and their verdict was that they never had seen finer fruit. We do not claim for it equal quality with some others, but in size it is equal to them. I claim that the Hornet is superior in quality. You cultivate them better by having the rows twelve feet apart. I have some six feet apart, and some eight, but those twelve feet apart succeed best. I mulched heavily with straw, and left from three to four canes in a hill.

S. W. PEARSON.—This was the situation of mine. I mulched them heavily. It was not a black soil, but a loose loam.

DR. A. FURNAS.—In Dr. Warder's grounds I saw the raspberries unpruned. I had been taught to pinch them back in the growing season, but I found his undisturbed. I visited him in October, about election time. I called his attention to the fact of their being unpruned. Says he, "There is no time lost; let them grow uninterrupted. If you cut off the top, you develop the lateral buds prematurely; a cold snap comes, and here they go; so I prune late in the fall." He said he would prune any time, when his vines were not frozen, until Christmas, having the wood well matured. We ought to have some system of treatment that will not induce the development of the lateral buds. In the last pruning of a hedge of mine, I trimmed a little too early, and consequently lost many of the plants.

J. A. MENDENHALL.—While I am an advocate of pruning back raspberries, the idea that it does not do to continue it late in the fall

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is incorrect. My plan is to cut them back in the summer, as soon as you get the fruit off of them, so as to get the canes stiff enough not to have to be staked. You can not get as good a crop by summer pruning, but if you want to get rid of the trouble of staking, it is the better plan.

J. COTTON.—I found it necessary to stake my canes last summer, owing to the amount of fruit. I staked the Philadelphia, notwithstanding they are very stiff. The amount of fruit, where not supported, bore them to the ground.

W. H. RAGAN.—This matter of pruning is an important one. I have taken some pains to find out when to prune, and I have come to the conclusion of Dr. Warder. This season I pruned back some of my varieties, and some of the plants of different varieties, in May, with a sickle-shaped scythe; cut them off about two-and-a-half feet from the ground. They threw out their lateral branches in great numbers, and seemed to become heavier in a few weeks afterwards, and broke over worse than those that had not been cut back. This fall I find that my best plants are those that were not cut back till done growing. I have never known the Philadelphia to need staking, nor any of the Antwerps that were pinned down in the fall and taken up in the spring. I doubt whether the black-cap Doolittle can be successfully grown without staking or fastening up to some kind of a trellis. We have a dozen varieties of Antwerps, but we do not know them by name. The Hornet is probably among them. There is one of our Antwerps that would really pay any man for cultivating and laying it down; it may be the Hornet. So far as the quality is concerned, there is no comparison between the Philadelphia and the Antwerps. The Antwerps are the best, yet we can make more money on the Philadelphia, from the fact that it bears without putting down. It does not prolong the season like the Antwerps.

J. W. FURNAS.—Our experience indorses Dr. Warder's, with the exception that we would rather trim in the spring. When we trim in the fall, we do not know what branches are going to die in the winter. As to trimming, I would only shorten in length, and let the laterals go.

T. BUSHONG, of Lafayette, called attention to a perpetual berry, called Bacon's Seedling. You can pick it every day from the time it begins to ripen until frost comes. Any one can get an account of it by writing to V. M. Bacon, of Lafayette. It bears largely, and of

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excellent quality. I am not personally acquainted with Miller's Daily, but I think the one of which I speak is much better than this.

ALFRED BELSHAM.—I can not give a very good account of Miller's Daily, having been absent most of the season; but I have never seen so fine a berry. A neighbor of mine has an acre in fine bearing. I have some of Bacon's Seedling, and I should not like to say that Miller's Daily is superior to it, under some circumstances. I have never seen so large and solid a berry, nor do I think there is a better bearer than the Miller's Daily. The first crop is fully equal to the first crop of the Black-cap. They appear to be perfectly hardy.

S. W. PEARSON.—In regard to Miller's Daily, I went to see the patch spoken of at Raysville. I think Parker gave a fair sample at the State fair; I think they had been taken right along, without any special attempt to select the finest berries. They were well loaded. I have never seen an ever-bearing berry that was anything like so well loaded as they were.

R. VAILE.—I wish to know if any gentleman has succeeded in raising the Lawton blackberry further north than the localities mentioned. I have some vines of this variety, but have not obtained a gallon of berries during six years.

Dr. FURNAS.—The blackberry business has a kind of twofold action in it. The best thing we can do for some of our poor land is to plant it in blackberries, and let them take care of themselves: just "stand off." In our trip to Terre Haute we went to friend Pegg's, and found him with a three acre lot that he tells us had not been ten dollars expense. It looked almost black all over with fruit. He said that he just lets it run. If his patch will not bear blackberries, he plows it up and lets them start again. He made a lot of money on them. Cultivating them in rows is a rough business; he does not like it. Their effect on the soil is such that if you let them take care of themselves, in three years you will have your ground pretty well recuperated.

J. C. RATLIFF.—The most successful cultivation of blackberries that has come under my notice is that of Nicholas Omer, of Dayton, Ohio. His vines are planted eight feet apart in the rows. He has a wire fastened to the top of posts and running through the row. He cuts the vines down to within a short distance of the wire. He raised eight hundred bushels from seven acres, and sold them for four dol-

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lars a bushel in Detroit. His net profit was $1,750. This is only a sample of his success in fruit-growing. He had just picked his small patch of strawberries the morning I visited him. In this the drouth caused his failure; he had only fifty bushels from five or six acres. The patch which he had just picked contained only three acres. He cultivates between the rows of blackberries with the plow, and tears everything up. He thinks two canes in the hill are better than four. When the large canes grow up, and some lop over, it is his practice to tie them up to this wire. They bear abundantly. The wire was placed in the center of the row. He cuts only on the top, to prevent them from growing too high.

J. GILBERT.—Silas Price, of Terre Haute, has the best patch that I have seen. He cultivates in rows; he keeps them clean by cultivation, and mulches them well.

T. MONTGOMERY, of Mattoon, Ills.—I am in favor of the Lawton blackberry, but it requires a deal of work and attention, and it will tear your clothes unless you are very careful in working with it. In Illinois they mulch it with the refuse from the sorghum mills. If you cultivate, do not let them get the advantage of you. The idea of letting things "rip" is not in the alphabet of the successful fruit-grower. I like the idea of the wire first rate. They do not winter-kill with us. As far north as Champaign they succeed well. We grow them in rich ground, too, because in our part of the State we have nothing but rich ground.

Inquiry was made with reference to the Kittatinny as a reliable and profitable variety.

F. BUSHONG, of Lafayette, spoke in its favor; said that he had known a case in which two hundred and seventy-three berries had grown on one stalk.

W. H. RAGAN.—I suppose some of my vines have had twice that number; I never counted them; I think I have had a gallon of berries from the Kittatinny on a single stalk; all were good berries. It is decidedly more hardy than the Lawton. As far as culture is concerned, it is not much nicer than the Lawton. I like the idea of mulching, and have been practicing it with a small portion of my oldest plantation. I have mulched one row with the prunings from the Antwerps raspberries. We go through in the fall and cut out all the suckers that need to be cut out; they have to be almost grubbed out. They are cultivated one way with a horse during the season in rows

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about five feet apart, leaving the suckers to grow up in a solid mass between the hills. We cut these out in the fall, leaving about four canes to the hill. The old canes are all cut out, and all this refuse is carried to this row of blackberries at one side of the patch. It keeps down everything but a sufficient number of blackberry shoots. In this way we have, annually, crops that I would not be ashamed for anybody to see.

Adjournment.

EVENING SESSION, January 3.

The following essay on pear culture, by Robert Manning, was then read:

BOSTON, December 24, 1870.

Dear Sir:—You asked me, when I saw you at Galesburg, to tell you something about pear culture around Boston, including, if I understand you right, some account of what has been done, as well as how it is done.

Our soil is well known as far inferior in natural fertility to the rich mould of the western prairies, such as I saw in the streets of Galesburg; yet it is for this very reason better adapted to the growth of the pear, for it is found that the excessive richness of such soil is too frequently accompanied by the dreaded blight, and no doubt causes it. I have never known the blight to prevail except in one season, that of 1848, when, as in the west, the Madelaine was found to be more affected by it than any other.

The past season the crop of pears has been unusually abundant, and prices for summer and autumn fruit have been lower than for some years. Good specimens of winter pears have commanded good prices. I know of a few bushels of Beurre d'Anjou being sold, a short time since, at the rate of nine dollars per bushel, but the number of purchasers at this price, of course, must be limited, and even if they were offered much lower, the appetite for winter pears is hardly developed sufficiently to create a demand for them in quantity. It is noticed that on the approach of cold weather the demand for pears falls off suddenly and largely, and apples take the precedence for general consumption. I account for this by the fact that the pear being a better conductor of heat is colder to the taste, just as certainly as a piece of iron feels colder to the touch in cold weather than a piece of wood; and the same fact will also explain the greater difficulty of keeping pears than apples, as, being better conductors, they are more quickly affected by the changes from hot to cold, and "vice versa."

The great collections of pears which formerly existed here, have, to a great extent, done their work, and, consequently, are no longer kept up—at least not in so great variety as formerly. The only object of such collections is to test everything for the purpose of choosing the best, and this purpose has been measurably accomplished. Yet it is to be noted that in the reaction from great collections we have, as usual, gone to the other extreme, and so few new varieties have been introduced of late years that the premiums for collections of new sorts, which had for some years been dropped, have been re-established.

As to the varieties which have been settled upon as the best, I can give no better idea of them than in the following synopsis of those shown at the annual exhibition

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of the Massachusetts Horticultural Society, in September last: Seven hundred and seventy-four dishes were exhibited, of which 65 were Bartlett, 46 Duchess d'Angoulemme, 45 Seckel, 43 Flemish Beauty, 42 Louise Bonne of Jersey, 42 Beurre d'Anjou, 35 Urbaniste, 27 Beurre Diel, 24 Sheldon, 22 Lawrence, 20 Belle Lucrative, 20 Winter Nellis, 20 Beurre Clairgeau, 19 Beurre Bosc, 19 Andrews, 17 Swan's Orange, or Onondaga, 16 Beurre Superfine, 16 Vicar of Winkfield, 16 Beurre Hardy, 15 Doyenne Boussock, 15 Howell, 13 Marie Louise, 11 Doyenne du Comice, 11 De Tongres, 10 Dana's Hovey, 9 Beurre Langlier, 9 Merriam, 7 St. Michael Archange, and 6 Buffum. These twenty-nine varieties comprised six-sevenths of all the pears exhibited, and are at least an approximate indication of the preference of cultivators, though it may be remarked that the size and beauty of Beurre Clairgeau have given it a popularity which it does not otherwise merit; that the season appears to have been exceptionably favorable to Andrews, which was, consequently, shown more freely than in most seasons; and that Dana's Hovey will probably be more generally exhibited in a few years than now. The names of all the varieties in the prize collections may be found in the *Journal of Horticulture* for December. Of the earlier sorts, Doyenne d' Ete, Beurre Giffard and Clapp's Favorite are the greatest favorites, closely followed by Rostiezer, Elizabeth, Supreme de Quimper, Tyson, Brandywine, and Boston.

In regard to cultivation, all that is found necessary is to select good trees, plant in any good soil, (if sheltered, so much the better,) and give so much pruning as to keep the tops in regular shape, and not too dense. That is all the pruning that is necessary, though if one is fond of the work of summer pinching and pruning, the pear affords ample opportunity for the exercise of his tastes. The ground must be well drained, either naturally or artificially, and a summer mulching of loose litter would be of great benefit. The ground should not be dug deeply, but only lightly stirred with a fork. As to allowing grass around them, there is no question that good pears are produced here under such circumstances; but it is the exception and not the rule. In my judgment this plan is much more likely to operate favorably on your rich western soil than on our less fertile ones. As to fertilizers, horse and cow dung, wood ashes, (when they can be obtained,) composts of meadow mud, and phosphate of lime, in its various forms, all applied early in the season, so as to produce an early growth and avoid a succulent state of the shoots on the approach of frost, are excellent. For permanent orchards, the pear stock is preferred, the quince being restricted to sheltered gardens, and even there the small size of the root, in proportion to the top, causes them to hang over when loaded with fruit, requiring the support of stakes or guys. The plan of securing standards by allowing dwarfs to root from the pear does not meet with general favor.

In arranging our schedule of premiums for the coming year, we found that heretofore the prizes for pears had been higher than the corresponding ones for apples, and when the question was raised whether this was just, it was unanimously decided that it was not, for pears can be raised here more easily than apples. I do not mean to say that the same quantity can be more easily grown, but it is easier to produce perfect specimens, and, I presume, the same would be the case with you, were it not for the blight. I wish I were able to aid you in preventing this terrible disease, but can only say that, to my judgment, Dr. Hull's plan of root pruning certainly looks promising; and were I cultivating pears in a locality subject to blight, I should give it a thorough trial. Even if not universally successful, if it has a good effect in a majority of cases, it will be a most valuable remedy.

ROBERT MANNING.

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W. H. RAGAN.—I regard this as a very valuable paper. It refers to their success at Boston with the pear, where they have been cultivating that fruit for a long time. He gives us in this paper the different varieties which succeed best and are more prominent there. Some of them I know to be our best varieties in this locality. The paper is very valuable to those wishing to plant, and interesting to those engaged in pear culture. I suggest that we elect Mr. Manning an honorary member of this Society.

I. D. G. NELSON.—I think we have never had a paper which contained so much good matter in so small a compass. I second the motion.

Carried.

W. H. RAGAN.—In behalf of Mr. Manning and the enterprise in which he is engaged, I wish to speak in favor of the *Journal of Horticulture*, of which he is editor. Some specimen copies have been sent to me, and they are now on the table. I think it is well worthy of our support.

DISCUSSION ON THE PEAR BLIGHT.

I. D. G. NELSON.—My experience with the blight is limited. I have tested many varieties of pears—some two or three hundred, perhaps—and found very few of them valuable to grow for private use, or anything else. The results of my observations are pretty much the same as they stand upon the list given by Mr. Manning. Some of them have never yielded any profit. In regard to the blight, I found a few varieties that were especially subject to it, and I cut them off from my collection. I have noticed that where the ground is very rich, pear trees do not do so well. I now cultivate very few varieties, and of these there is but a small number—not exceeding fifteen or twenty—that I consider worthy of general cultivation. In regard to winter pears, he strikes at the thing just where I stand myself. I think they should not be recommended for general cultivation. They will never come into general use. They are not acceptable to the people in winter. Very rarely, indeed, do we find a pear that will take the place of the Swaar, or the Canada Red, or many other varieties of apples that I could mention. The pear

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is a *fall* fruit. Very few very *early* pears do much good, as a commercial crop, at least. I have never had the blight touch the Flemish Beauty on my grounds, and I have many trees which bear abundantly. I have never known it to injure the Belle Lucrative. It is a hardy pear, and does well with me. The winter has killed the Bartlett, but the blight has not troubled it. The Beurre D'Anjou is the best of all, to my mind; the tree is hardy, pretty productive, and thrifty, and the pear is good enough for anybody. After that is gone you scarcely want any other variety in winter. Some are good, but you can not get much out of them. The fall pear is valuable for use and as a commercial fruit. Upon my place the White Doyenne does admirably. I know of no pear that excels it in productiveness and excellence of fruit; while a short distance from me it does not succeed at all. In this matter of cultivation of pears we have to be governed by our own personal experience. The Flemish Beauty does better with me than any of the other varieties; but it can not be kept long. If it were as good a keeper as the Bartlett, I would think it the most valuable pear for cultivation. They can be shaken from the tree when pretty green, and yet be in a pretty good condition. The use of fertilizers, spoken of in the essay, refers to Massachusetts. They are not needed here. They tend to prolong the growing season, and make the wood tender. If we do not get an early growth, of course, we can not have a hardy tree. I do not know the origin of the blight; neither do I know any remedy. I plant my pears as I do other trees—just as they come from the nursery. I am not very much of an advocate of dwarf pears, under any circumstances, and could not adopt the idea expressed in the paper of making standards of them; the standards are much better for all purposes. I find the pear to fruit about as early as apple trees, or a little earlier. I do not trim my pear trees at all; they do not require it, as a rule. If you grow the Rostiezer, which is a very nice, early pear, if you do not do something with the tree, it will hardly stay on your grounds. In such cases I cut away some of the branches; but, in general, I only trim to give shape to the tree.

W. H. RAGAN.—I think friend Nelson is mistaken in regard to Mr. Manning's meaning, where he refers to the planting of dwarfs with a view to their conversion into standards. He does not recommend that. He says we seldom get as good trees in that way. We have had the best results with standards—have had three good crops

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from our standard trees, planted in 1864; while an apple orchard, planted in the spring following, has never yielded anything.

Dr. FURNAS called attention to the frozen saps theory of the cause of the blight. He said it had its origin in this city, with H. W. Beecher, and it seems to be supported by many facts. On the 25th of October, 1869, we had an unprecedented freeze, catching the sap in the tree, and the next year breaking out in blight, not only in the pear, but, with us, in the apple also. In my observations this last summer, which were decidedly limited, however, I passed from here to St. Louis. I saw the blight everywhere; and in some places in Illinois it was much worse than here. It occurred to me that if it were not possible that so much sap was up in the tree when the freeze came, it was rather singular that we were so much troubled with the blight last summer, when we had not been before. The questions arise with me: Did the same cause produce the blight in the pear and the apple? What induced it? Had it any relation with this freeze, etc.?

J. COTTON.—I fully indorse the idea advanced by the essayist as to rapidity of growth being contributive to the disease. I noticed last summer, when the blight was worst, that along the river in Ohio and Dearborn counties it was very severe. In some localities the trees suffered very much. Some orchards were almost entirely destroyed; while on the clay lands about Morris Hill they entirely escaped. I do not recollect having seen any symptoms of it in our town. The fruit was rather better than common. There we have a clay land, and we almost escaped. I have some Seckel pear trees growing that fruited the third year after planting. Each bore a peck of excellent pears. These trees were hilled up a little above the surface at planting. They have grown fast enough and are now in a healthy condition. I adopt the idea brought out in the paper that the richness of our soils, causing a rapid growth, is the cause of the trouble.

DR. FURNAS.—What was the object in earthing up these trees?

J. COTTON.—It was to afford drainage; the land was a little too wet. The pear needs a dry position to mature in.

W. A. RAGAN.—The first thing we find on the subject of frozen sap blight is in Downing's work published in 1845, in a note at the foot of the page, in reference to the suggestion of Reuben Ragan that frozen sap is the cause of the pear blight. Dr. Furnas has referred to two

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kinds of blight, one on the twig, and the other on the body of the tree. In the first kind we find no effects below the twig in the present year's growth, while the tree otherwise is healthy and good. The blight from which we suffered, and from which our trees died, is somewhere in the body of the tree or limb. We find the limb or whole side of the tree dying, and by examining down you find black places somewhere on the side of the tree. You also find a black poisonous-looking fluid, which may result from the freezing of the sap. It is universally found in the pear blight. The freeze may catch the tree while the sap is flowing; it becomes vitiated and sours. Sour sap is a better expression for this poisonous sap, let it come from freezing or what it may. The pear blight follows certain kinds of seasons. In this country it destroyed our pear orchards in 1844. The season before the wood was unripe and the sap still in the tree when the freeze came on; the next summer the trees nearly all died of pear blight. This is the point from which the theory first started. The cause is somewhere in the tree, for early in the spring there are no indications of the disease, except that in places the wood and bark are of a dark color, and the sap apparently changed in some way. When the tree commenced growing in the spring, this poisonous fluid was carried up, and poisoned the tree, and it died in a few days. We can trace it to no other cause than this sour sap. Fall before last, an extremely cold spell came on and caught our trees while they were growing thriftily and rapidly, the wood in an unripe condition, consequently this last season has been very fatal to our pear orchards. Whenever we find pear blight in the country, we find it preceded by a season in which the wood was unripe and the sap in full flow when the freeze came. The reason why trees that are growing rapidly are more subject to blight than others is because they continue to grow later in the fall and the sap becomes vitiated by early freezing, whereas trees on dry clay land "wind up" in proper time, and have the blight very little; consequently our pear trees should not be forced. The less the trees grow the less we will find of pear blight. There are other theories with reference to the cause of the blight. Some very able men contend that it is a fungus growth proceeding from microscopic seeds or spores; others think it the result of the attacks of insects, as they are often found in the location of the disease. They might as well think that the maggots in a dead horse kill the horse, as to suppose that these insects kill the tree. The diseased condition of the tree induces these

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insects to work in the wood. I do not understand that the blight in the apple and the pear are the same.

DR. FURNAS.—Can we reconcile the idea that the predisposing causes are not the same, when the disease appears in apples and pears at the same time, following such a fall as that of 1869?

DR. R. T. BROWN.—In regard to this disease, I do not know any thing about it, nor do I believe any body else does. I can conjecture many things. This much we know, that some things do follow each other in a uniform order, and we very naturally infer that one is the cause of the other. In fact, I believe it is a kind of instinct that when two things follow in order, we set down the first as the cause and the second as the effect. Instinct is the safest guide we can have when we grope our way in darkness, where we can not see the fact. It is true there are two forms of blight; one affects only the present year's growth, and at the time of growth, perhaps not later than July; the other extends itself through the limb on which the leaf-growth is attached, and even to the body of the tree. While the leaf-growth turns black and the leaves die, if you cut the wood below that you will find it affected too. If you examine the Cambium layer, between the bark and the wood, which is at that time in a soft or gummy state, you will find that it is black, and acid in its character. It will turn purple litinus paper red. This forms a very delicate test, and if applied to the moisture contained in the twig that is affected, it shows the presence of acid, and the twig has a kind of rotton wood taste. But whether the sour sap is the result of the death of the twig, or whether the twig was killed by the sour sap is a question I am not able to solve yet. You will find the discoloration of the cambium layer under the bark before the leaf shows it at all, or rather the dying of the laminæ between the bark and the wood. Now if I were going to tell you what I *guess* about this thing, I should say I do not believe it is the freezing that does it in the first place. I have no faith in the "freezing" theory. It is not freezing that does the mischief, but it is in the thawing where the trouble lies. It is like the man who fell about twenty feet. He said the fall didn't hurt him but the *lighting* did. I do not think that the freezing of fruits kills them at all, or very seldom at least. If vegetables freeze and are permitted to thaw slowly in the dark, excluded from the sunlight entirely, but little damage is done by the freezing, in many vegetables none at all; but if you freeze a vegetable, and let the direct rays of the sun upon it in thaw-

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ing, you inevitably kill it; all vegetables are killed in that way. But if you thaw plants with a cloudy day, a rain, or any other way, except in the sunshine, very little harm is done. Two years ago, on the 19th of October, we had a snow, and on the morning of the 20th a severe freeze, that was not a frost merely, but it froze ice, froze the wood, froze the apples on the trees pretty nearly solid. The morning following we had a bright October sun. The sun was high up in the heavens, just beyond the equator, and it poured its rays upon the frozen trees with an energy that destroyed the unfinished growth in a day. It left no visible signs on the outside, and we did not see anything wrong. You remember how the trees grew in the spring. When the ascending sap goes up it does not pass up through the bark, or through the space between the bark and the wood, but through the capillary tubes of the white wood, hence this frozen bark did not at all affect the first growth; the thawing did no harm to the sending up of the material to develop the first leaves, and everything went on nicely and finely till the eliminated material from the leaf began to descend to form the layer of new wood under the bark. As soon as this commenced, the bark and wood which were injured by the freezing and thawing obstructed the passage of the sap, and it could not get down; so the whole limb died suddenly from what medical men would call congestion—congestion of the sap; a flowing upward, with an inability to make a downward flow, and instantly the part through which there could be no downward flow died. Now that may not have affected the whole tree; it may have been confined to some of the limbs. You will notice that limb blight or bark blight almost invariably affects the western or south-western side of your tree; this is true of winter killing also. You will rarely find a tree killed on the north side where it freezes so hard, but on the south side where it thaws so much. Our trees thaw to death. This may perhaps be prevented by fastening together two pieces of plank and placing them on the south side of the tree; in this way you secure it from frequent thawing. I wish we could all get hold of the importance of this matter of sunshine in thawing these things. One of the hardest things in the world to kill is blue grass; but if you take a frozen blue grass sod and turn it up to the sunshine such a day as this, for two hours, then plant it out and cultivate it the best you can, you can not make it send up a single germ. And so it is with the roots of almost all our vegatables. Nature covers them up in the ground, thaws them in the dark, and they are uninjured. Take an apple and put it out to-night, let it

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freeze perfectly solid, then put it away in your cellar, exclude it entirely from the light until it has slowly thawed, and in a week you can scarcely see that it has been frozen; but if thawed in the sunshine it will be as soft as if baked in an oven. We can take in the body of the tree and exclude it from the trouble; but how about the limbs? They may be damaged greatly while the trunk shows no indication of injury. Now it is entirely possible that the circulating sap may be affected in such a manner that when the growth is progressing the feeble life force permits fermentation to take place; and that may be the result of last season's freezing or thawing; not leaving any effect on the tree itself, but affecting the vital circulation. Now take the juice from a growing apple or pear twig, and you will find that it contains sugar enough to ferment in the proper temperature at any time. What is the reason this does not ferment in the growing twigs; It is because the vital force prevents it. The same thing prevents it from fermenting that prevents a living tree from rotting. Yet it may be so enfeebled by freezing and thawing that it can not prevent this fermentation. I think the same thing will apply in the case of pear blight. There was a good deal of pear blight in this locality on rich clay soils, but in our gardens, in this hot sandy soil, where the heat of the summer had aroused the growth early, we had none at all. I do not remember to have seen any on that kind of soil in this city.

QUESTION.—Could forest protection be made available in the prevention of the blight?

DR. BROWN.—I suppose evergreens might be made available, and even deciduous forests may be, because there is a material difference between the temperature in a forest and on the open ground. A living forest has a strange influence. A living tree, though frozen, is still several degrees above the temperature of the air on a very cold day, though it may get down to the freezing point; and that increased temperature from the life of a living forest, renders the air warmer; and we may often protect in that manner. We can protect, with certainty, with evergreens. The cedar, Scotch pine or fir, will give protection from the frost, or the influence of sunshine when the sun falls low, even in winter. It may be thought that the same thing that protects you in the winter time, will be in the way in summer in shutting out the sunshine when it is needed to assist in the growth of the trees, but you will remember that the low position of the sun, in the winter months, throws the shadow

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far over; while in the summer months, it falls nearly in a vertical line to the ground, so that the shadow will fall over in the winter where it would do no injury in the summer.

QUESTION.—Do you recommend planting on the north side of hills?

DR. BROWN.—Yes; but they will not make so much difference, because the trees will grow up vertically.

DR. FURNAS.—I do not understand the difference between the two pear blights. Can you show any distinguishing marks between the two, but condition?

DR. BROWN.—No; I "guess" they are exactly the same, only differing in intensity; one effecting the tree far enough to destroy the cambium layer between the bark and the wood, and the other going only so far as to effect the fluid sap; one effects the growing wood, the other, the wood that grew last year.

R. VAILE inquired on which side of the orchard, north or south, he would recommend the planting of forest trees?

DR. BROWN.—I would plant them on the south side. I know no remedy except for the trunk. We never think there is any danger until the thing comes. We hardly ever take the precaution to cut back. I think we might prevent pear blight in this way to some extent, as it certainly results from excessive growth and imperfect ripening of the wood before frost comes. But I have tested this matter of protecting trees. Take cherries that winter kill, and you will find that the killing takes place on the south-west side. I saved a very nice Black Spanish cherry, at Crawfordsville, by boards nailed together at right angles, set on the south side of the tree. This plan carried it through the cold winter of 1856, without any indication of damage.

W. A. RAGAN.—Dr. Brown's theory entirely corresponds with my notions on this subject. The result of the freezing and thawing is the first cause from which the sour sap results; but there is one part of his guessing that I do not understand. He is right about the sap flowing up through the white wood, and that the bark may be black all round, yet the sap will flow up, and the tree will put forth leaves when the wood is dead. The wood is formed when the sap flows down, as he stated, but the bark may be taken entirely from the tree for several inches, and the tree will go on, ripen its

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fruit, and put forth leaves the next year. At the same time, the sap will flow down and a lip will be formed all around the point where the bark is removed; why should it not do the same in the diseased tree? You will never find indications of the pear blight, but that the disease is located somewhere below. You will find on the side on which the disease is located, a dead limb, or half dry wood. It shows wherever this sap is absorbed and carried up, the disease is carried up with it. The blight may not result from one single freezing and thawing, but it is the continued action of these causes that induces the disease. The same is true in reference to the borer. You will never find the borer except on a part of the tree where the sun strikes it most forcibly. The insect has an instinct that causes it never to lay its eggs in any place except where there is frozen sap. Anything that will prevent this sour sap in the tree, will prevent the blight, and also prevent the tree from being killed by the borer. You can save the tree from the borer by the use of boards, or by any process that will protect them from the direct rays of the sun in cold weather. I think we can accomplish more in preventing the blight by having the tree on suitable soil, than by root pruning.

PROF. E. T. COX.—What is the normal condition of the sap? Is it acid, alkaline, or neutral?

Dr. BROWN.—In the growing apple tree it is neutral.

PROF. COX.—The Dr. Hull system of cutting around the roots to improve the health of the tree always reminded me of the system of bleeding that used to be employed by the doctors, in all cases, to eradicate disease. That system has been pretty well discarded now. I think the root pruning system is probably erroneous. The main cause of the blight, in all trees, is the condition of the soil on which they grow. When we have the soil in proper condition, the trees will be less subject to blight. I do not say that under all conditions disease will not be brought about, but the trees will have a healthy growth if the soil is proper. When our heavy clay soils are underdrained, the blight will stop. It is owing, altogether, to the want of proper and thorough drainage and circulation of air around the roots of the tree. When the sap becomes vitiated, the tree loses its vitality, and the freeze has a greater effect upon it. When in a healthy growth, its vitality resists the effects of the cold; hence every source of this disease will, I think, be found in the soil itself. Not an individual in this house can show an instance, unless of untimely frost or an

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unnatural climate, of a tree suffering from blight where the soil is well under-drained.

DR. FURNAS.—Where a tree has succeeded well for many years, and then breaks out in the blight, how can it be reconciled?

PROF. COX.—It requires more nourishment to support the increased growth of the tree, and it becomes enfeebled, perhaps by age. I suppose there is a period of maximum growth and final decay. Now, after they reach a certain point, they may have less vitality and less means of taking up nourishment to keep every point in perfect health. At the same time, the roots are less vigorous than when young, and the physical character of the soil is such that the tree can not seize hold of enough nourishment to keep up its vitality. If the soil is not perfectly under-drained, and if the circulation of the air is not perfect around the roots, the tree may starve to death in the midst of an abundance of food. There is scarcely any soil but that has sufficient plant food in it to sustain plant life, if it is in such a condition that the plant can take hold of it.

DR. FURNAS referred to some statements in the essay by Mr. Manning: It is the rich ground that induces the trouble, by making a preternatural growth which is not matured. He thinks this fact would go in opposition to the ideas of the last speaker.

PROF. COX.—When the roots of the tree are in the midst of a large amount of food, it brings on an unnatural condition of the plant, which produces a large quantity of soft wood and an unhealthy growth. It is not the superabundance of food, but the inability of the plant to mature its growth that gives us trouble. I wish to know if any one has known any cases of pear blight where there is thorough drainage.

I. D. G. NELSON.—It did appear so at St. Louis.

DR. FURNAS concurred in the same opinion. He believes the blight does occur frequently where the ground is well drained.

PROF. COX.—There may be certain unnatural conditions in which the tree is growing; there may be certain abnormal trees whose condition may have been brought about by artificial means: nothing can save them in their unhealthy state. The soil may not be well adapted to such trees. Some of the trees referred to, at St. Louis and other places, may have been out of their proper element. I think the main cause of the disease will be found in the soil itself.

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MR. SAMPLE, of Lafayette, said he had had a little experience in the cultivation of pears. He had a piece of ground that was remarkably poor which he planted in pears four years ago, having made a selection of seventy or eighty varieties. He manured the ground very highly with bones, etc., from the pork-house. The next year he lost at least one-fourth of them; he filled their places with others, and the next year he lost only a few. He then went to work and under-drained the ground well, and last year he never saw a finer growth of trees. The trees were planted twenty feet apart. He dug ditches between the rows three-and-a-half feet deep, and put in tile. He hauled manure from the town, and piled it up several inches about the trees. He attributes his success to the underground draining.

DR. BROWN.—I regard under-draining just the same as the old steam doctors, when I was a boy, regarded lobelia: that it was good for everything.

MR. MCHENRY, of Dearborn County.—My idea is that it is just as needful to feed my trees as it is to feed my sheep or cattle. I feed them twice each year. All that men want in order to have good fruit is to feed their trees. In planting, if I can not drain the ground, I dig a hole by the side of the tree to carry off the water from the roots. In this kind of business, there is a great deal in the kind of ground on which the trees are planted.

MR. KIMBALL, of California.—There is no mistake but what the pear crop is a valuable one, but it is not best to try to raise too many kinds. A few kinds only are desirable. It is nice to have many kinds to look at, but when we want to realize money, five or six kinds are all that are necessary. The best kinds, in my opinion, are the Belle, Bartlett, Sheldon, Duchess, and Vicar.

The following resolution, offered by J. Cotton, was adopted:

Resolved, That it is the sense of this Board that underdraining is the best preventive of the pear blight.

MORNING SESSION—DR. FURNAS IN THE CHAIR.

TRIP OF THE OFFICERS OF THE INDIANA HORTICULTURAL SOCIETY TO TERRE HAUTE.

The Indiana Horticultural Society has generally had an *ad interim* committee, whose duty it was to examine and report upon such fruit as could not be exhibited at the annual meetings. This committee was also expected to report on any and all

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subjects of general interest to the cause of horticulture in the State. The necessity of such a committee is apparent to every fruit raiser, yet very little has ever been accomplished by it. Of so little use has been the labors of this committee that it has been left off for a year or so past. The officers and Fruit Committee, constituting a Board of Horticulture, made a beginning on Thursday, the 4th day of August, by a flying trip to Terre Haute, meeting with the Terre Haute Horticultural Society, and visiting the fruit growers in the vicinity of the city.

The party first visited the grounds of the Heinl Brothers in the south-eastern part of the city suburbs. These brothers are workers, as is plain to be seen as soon as you enter their grounds. They have several greenhouses and propagating houses, and are the principal florists of the city. We first noticed the Van Buren golden dwarf peach, which is being tried, with the result of just one peach this season. They have several varieties of apples on paradise stocks, which makes very pretty dwarfs. The grapes (a list of which we did not get) were doing finely; many of the early varieties, such as the Hartford, were coloring nicely. But little rot was to be seen. In pears they have a few nice specimen trees. We noticed Bartlett's Flemish Beauty, Clapp's Favorite, Seckel, and many others. They make a specialty of the Irish Juniper, and the long rows of this beautiful evergreen gave evidence of superior cultivation. Neatness and thoroughness generally are characteristics of this enterprising firm of nurserymen.

In the afternoon we visited the horticultural meeting, which was held over the river, at the house of C. W. Barbour. After an interesting drive up the river bottom some three or four miles, we arrived at the place where the meeting was held, which we found largely attended, organized, and going on with its business. The ladies seemed to constitute as large a part of the meeting as the gentlemen, and, in their participation in it, acquitted themselves handsomely. One lady read a very sensible essay on cookery, which we would like to have procured for publication, but it had to "take its place on the files," and we suppose that will be the last of it. The table was well filled with apples, grapes, blackberries, mulberries, tomatoes, etc. Every member was called on for "remarks," most of whom responded in a practical way on some subject in connection with the fruit interest. Some very beautiful specimens of red-stripe apple were presented for a name; also some Golden Sweeting, which the meeting named respectively. The great subject of discussion was the profit of fruit-raising, to which was added the appendix on the mischievous effects of curculios and codling moths. United effort in the destruction of the former by jarring the trees and catching them upon sheets, or with the curculio catcher, was recommended, and for the latter, Dr. Trimble's *hay band* around the body of the tree under which they will secrete themselves, to pass their pupa state, or by hanging old clothes in the top of the tree for the same purpose—by either of which they can easily be destroyed. Lighted lamps were recommended by some as a sufficient means of attracting the codling moth to the light by night, but was condemned by others. There was one thing about which all were agreed, and that was that "something must be done;" but what that something was did not appear so clearly as to entirely satisfy all present. All, however, concurred in the opinion that all wind-falls should be gathered by hand and destroyed, or consumed by allowing the stock hogs the free run of the orchard.

After the adjournment, supper was announced, which, to say the least, was magnificent. Though some of our party had excused themselves from participating in the discussions just closed, yet all of them made full hands in this feature of the exercises.

This closed investigations for the day, and our party was divided up among those

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present for rest until the next morning; and when we met again on the morning of the 5th, each one declared that he was the most fortunate in being assigned to kind friends. Being individually assigned to Hon. H. D. Scott, our investigations commenced on his grounds at an early hour in the morning. Senator Scott is an enthusiastic amateur in fruits and flowers, having a small but well arranged greenhouse, as well as extensive vegetable garden, orchard and ornamental grounds. We tried to assist in correcting the nomenclature of his list of apples; found some fine Summer Queens, Hightop Sweetings, Summer Pennocks, Early Joe, Ortley, Baldwins, etc. As the work of the codling moth is to be seen everywhere, of course it is here. The grapes on these grounds are rotting some little. Pruning is done on the let alone system, measurably, and if persisted in will certainly result in an unmanageable and unprofitable vineyard.

We made a short call at M. S. Durhams, and then visited A. B. Pegg. Here we found abundance of interesting material. First we visited his Lawton blackberries, of which he has some three acres. The yield is seventy bushels per acre; he pays seven cents per gallon for picking, and gets fifty cents per gallon in the market, while he said his whole expense of culture this season had not exceeded ten dollars for the entire crop. Friend Pegg said the crop was miserably gathered, but to us, who were unaccustomed to such sights, the crop was quite full even then. We must pass the large apple, pear and cherry orchards, where we found not much to criticise, but on the contrary much to commend, and take a trip through his vineyard of 2,500 bearing vines. The trellis system is in use, wire being substituted for laths. Some rot was to be seen; "too much vines" was the advice given. These vines must be thinned, or a failure may be anticipated soon.

The principal varieties are Catawba, Concord, Hartford, Clinton and a few of several other sorts. The vines are all full of grapes, and promise a good yield. But we must hasten on.

Next we called on Joseph Gilbert. Here we found a large collection of everything in the line of both large and small fruits. The vineyard of several thousand vines, mostly of leading varieties, all of which are in full bearing, was a splendid sight; yet the knife must be used, or too much bearing wood will be the result, and a consequent deterioration of the quality of fruit. Sixteen hoop apple trees, about two feet in diameter, are yet thrifty, and, at this time, loaded with nice apples. Some of these trees have yielded fifty-four bushels of apples to the tree, of a season, which brought one dollar and fifty cents per bushel! We doubt if a much better record can be found in the State. These sixteen hoop trees would support a small family economically provided for, besides laying up something for a "rainy day." After a boat ride in the Shoo Fly over his fish-pond, we left, feeling that if any one else wants a pleasant and instructive horticultural visit, as well as to meet an enterprising fruit-grower and extensive farmer, he had better visit friend Gilbert.

We next took a Dutchman very much by surprise—Edward Haas. This gentleman has fifteen acres of ground, and does all the work himself, both cultivating and marketing. How one man can do so much, even if he is a farmer, is more than we can comprehend. He apologized by saying: "Every ding is in de weeds." A look through his grounds proved his intelligence as a cultivator—and such pears we did not see anywhere else in our trip. Howell, Clapp's Favorite, Sheldon, Bloodgood (the latter ripe and gone), Bartlett, Flemish Beauty, Seckel, Belle Lucrative, Doyenne, d'Ete, and many others, all sound, thrifty, and productive. Five thousand grape-vines were in fruit, all looking well, with the exception of a very little rot. The grape arbors were very cool and inviting; but we had to bid farewell, to look elsewhere.

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Our party next called on Phil. H. Monninger, about a mile north of the city. This is another German, with a little plat of sixty thousand grape-vines. Forty thousand of these are now loaded with grapes. Friend Monninger has more of the "get up and go" about him than any man we ever met, big or little. There is just as much energy, politeness, kind attention, communicativeness, and enthusiasm as can possibly be put in a man that wears no bigger breeches than he does. When told the object of our visit, he made us welcome, and immediately led the way through his extensive grounds, pouring forth his practical remarks in reference to grape-raising, including every department, from propagation up to the ripe grapes, as well as the manufacture of the wine. The culture is clean, the pruning carefully done, and the vines neatly tied to the trellis, which is principally of number twelve iron wire. That his system of culture is a success now, can not be denied. It is, however, comparatively new, and may not bear the test of time. For instance, he believes that by deep planting the roots of the vine may be kept far beneath the surface of the earth, and thus guard against injury from the drouth or frost. He also makes a specialty of pruning off the "dew roots." Again, he favors and practices low training, so that the fruit often touched the ground. The *renewal system* is also put in practice, and every means used to furnish a succession of bearing wood, and work out the old. When asked if he trenched his grounds, his answer was, "You bet, two to two and a half feet deep." In many places he had hauled gravelly soil and spread it over the vineyard, since the planting of the vines, to the depth of two feet. When some of our party asked if the grapes would not get dirt on them when trained so near the ground, he said it made no difference for wine. He proposes to make his entire crop into wine, and thinks every four vines will make a gallon. Then his entire crop will yield ten thousand gallons of wine. Friend Monninger thinks that the rot in grapes is induced by the sting of a large brown beetle, so often seen on the grape vine. In this opinion he runs against the authorities of the times, and he or they will have to back down. Not trammeled by books, or theories, he is able to impart much practical information; but we miss our guess if as close an observer as we think he is, will not have occasion to change some of his ideas in less than five years. We noticed a large force engaged on a wine cellar twenty feet wide, twenty feet deep, and seventy feet long. We left this vineyard feeling that we had learned some good lessons in grape-growing.

Our party took dinner, by invitation, with C. Barbour, about two miles north of the city. He is a farmer and dairyman; has a farm of three hundred and twenty acres, as rich as is to be found on Fort Harrison Prairie. He showed us a thirty-acre field of corn, eight acres of which is entered for the premium on corn by the Vigo Agricultural Society. Best judges say this piece of corn will go considerably over one hundred bushels to the acre.

Our visit being finished, our friends who had joined us at Terre Haute returned us to the four o'clock train, in time for our return. The Terre Haute fr growers have already accomplished much, and will achieve more; but there is o.. feature among them in which we look for no improvement, simply because there is no room for any. That is the hospitable way in which they took care of our party, by providing conveyance, suspending their own work, and showing us around, and in every possible way anticipating our wants. We can not close without specially mentioning the obligations imposed on our party by Joseph Gilbert, John G. Heinl, Senator Scott, A. B. Pegg, and C. Barbour.

Our party is also placed under obligations to General T. A. Morris for the liberal manner in which he lent his aid to our investigations, by passing all of us over the new Indianapolis and St. Louis Railroad free.

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The Doctor added, in reference to the attentions shown the party by the railroads, etc., that on behalf of such liberality and kindness, we have met with more than we anticipated. I have heard some people grumbling in regard to the railroad men—that they are not disposed to accommodate the public, etc. I have found nothing of the kind myself. General Morris tenders us passes to any place we may wish to go on horticultural investigations. Such men as General Morris, Colonel Simpson, and David Macy, are ready and willing to do anything for us; they will second our efforts, and if any are to blame, it is we, for not stirring this thing up. This liberality on their part, encourages work, and increases business over the roads. Whenever there is a living society here, you may depend upon the railroad men helping you.

T. MONTGOMERY, of Illinois.—The Illinois Central is denominated by many people as one of the greatest monopolies in the Western States. But it works to the interest of horticulture, and *ad interim* committees are passed over the whole length of the road, on their visits to the different parts of the State. When railroad companies see live men engaged in any enterprise like this, they can not fail to discover that, as the thing is developed, it will only bring money into their hands; therefore, it is only necessary to "knock, and it shall be opened unto you."

The following resolution was offered:

WHEREAS, The Purdue Agricultural College, located at Lafayette, embraces, and fully recognizes the science of Horticulture in its contemplated course of instruction; and,

WHEREAS, In the organization of the Board of Trustees of said College, this Society was left without representation; and,

WHEREAS, Such representation would, in our judgment, contribute alike to the interests of the College and the Society; therefore,

Resolved, That the Society, at its present session, appoint a committee of three, to memorialize the incoming Legislature of this State, to grant this Board a suitable representation in the Board of Trustees, of said College, at the earliest convenient date.

(Signed,) J. COTTON.
W. H. RAGAN.

DR. FURNAS said he was glad the resolution had been presented. It is necessary for the people to let their wants be known if they are to be granted. The matter must be pressed upon the Legislature by memorials and petitions from every side. In this you must let the people know you are anxious to be represented, and then

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ply them in earnest, and right along, till they comply with your wishes. When the subject comes before the Legislature, let us send in resolutions and petitions—anything, and everything, to take them by storm. The thing lies with us—with you, with me, with all of us.

J. COTTON.—I understand there was a disposition, on the part of the members of the Legislature, when the subject of the Agricultural College came before them, to decline the whole thing, and it came near being rejected; but for the efforts of some earnest agricultural and horticultural men outside of the Legislature, it probably would have done so; by their exertions it passed, and will now soon go into operation. Now, as this institution, as the preamble sets forth, recognizes fully the science—the beautiful, the grand, the important science of horticulture in its contemplated course of instruction, it is appropriate, it is right, that this Society should be recognized on the Board. Then we can get into the practical workings of these grand institutions that we are getting up in the State, and can all work harmoniously for the result.

Resolution adopted.

PAPER ON TREE PLANTING, BY T. MONTGOMERY, OF MATTOON, ILLINOIS.

TREE PLANTING.

Having been a citizen of Hendricks county until about six years ago, when I took up my residence where, according to your correspondent, Mr. Ragan, the mania for tree planting prevails, and it would not be strange if I by this time had caught it; and since reading his article written upon attending our State meeting, at Galesburg, I have traveled over considerable of the central portion of Hendricks, which county I take it is more than an average county in horticultural interests, considering the number of the officers of your society taken from its citizens. I confess to you that my opinion is that it would be well if this tree planting mania was contagious. In all my travels and observations, I noted the decay and death of almost all the old orchards, and only one man, Enos Hadley, who was supplying the place of old trees with young ones; and but very few young orchards planted. In the neighborhoods of Dr. Furnas, Ragan, White and Pearson, unless they are planting on a very large scale, much more than I have reason to believe is done, the fruit crop in Hendricks county will, in a few years, be very much decreased, as the old orchards to which I have alluded are now gone beyond redemption. The fruit must be of very inferior quality, as a healthy tree alone produces good fruit. I have only alluded to apple trees. As to the other fruits, peaches, cherries, grapes and small

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fruit, no attention is given to them; and more than one place where I have been, they set on their tables the Wood raspberry, notwithstanding the efforts of Doolittle, and one hundred and one others who have cried out, "Eureka!" Of course, near large cities and good markets, they are going on cultivating their fruits and their tastes for the same, and should not be included in above allusions. But there certainly is still room for the mania of tree planting in Indiana, and when you take into account the wholesale destruction of forest timber, there is no attempt as yet to supply the lack of timber that must soon come upon you. Counting the present value of timber trees, walnut, poplar and oak, very much of the land would be worth to-day, five times as much if it had its original timber standing as it was ten years ago; and when you reflect that this destruction is wholesale, and embraces in its length and breadth all the north and northwest, it only requires but a thought, and the fact that now from $50 to $75 is offered for one walnut tree, just such as Mr. Ragan in his forest life used to call in his neighbors to roll in heaps to be burned, and which many others of you have no doubt also done. Where will the next generation get their walnut lumber from? The same is true of the oak. Thousand of dollars to-day paid out for staves on all your railroads, and the cry is more cars for their transportation. Viewing these facts and considering their importance, knowing the value of timber, and appreciating it as we do in Illinois, I would say, "Woodman, spare the tree;" to all, save your timber; plant two, yea, a dozen, where you wantonly destroy one; by all means, catch the tree planting mania before you convert your lands into a worse than prairie state.

W. A. RAGAN approved of the recommendations of the paper. The fact that we often fail in obtaining a full crop of some kinds of fruit, should not prevent us from planting trees. Sometimes we do not raise a good crop of wheat for five or six years, but the farmers persevere; they are not discouraged; and at some time they reap an abundant harvest. We must have fruit in our country. If it is hard to raise fruit, it will be worth a greater price. If it takes twice as much to raise a bushel of fruit as now, it will be worth twice as much to us. Men will have to be paid for raising it. If we do not have so many, and so good apples upon a tree, we must have more trees. The great trouble is, we sometimes get up too big estimates of the profits, as we did last night over the Lawton blackberry. Men become maniacs on the subject, and go into it largely by planting certain kinds of fruit; they are taken care of for a while, then are neglected; the grass grows up around them, and the experiment fails. Instead of a wail going up here in Indianapolis, and discouragements going forth from this Society, we ought to send out recommendations to plant more fruit trees. Fruit is one of man's natural diets. Without it, he will not be vigorous and healthy. The acid in the fruit is just as much necessary to keep the system in good order as the oil is to a machine.

J. COTTON.—I fully indorse the old sentiment, that "he who

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plants a tree is a benefactor to his race." My attention has for several years been called to this wanton destruction of our native forests. Four years ago I read in the *Scientific American* the statement, made and sustained by a careful observer, that unless there is a change in the practice of the American people, we shall experience a wood famine within fifty years. I think we ought not to destroy the tenderest shrub; let it grow. If it is not in the right place, take it up and put it there. Do not destroy it. As to planting, I am here as a learner. I know but little about horticulture, but I want to learn a great deal. I can make as much fuss over a tree as any man in the world; I can talk to it, hug it, and love it as much as any man. I am trying to raise some fruit trees; I am trying to fix a home to live in; and everything that pertains to home government and food is interesting to me. In small fruits, I have succeeded as well as my neighbors—better than many of them. We have a horticultural society in our neighborhood, which is a success. We have our festivals about once in six weeks; get our wives and children out there; eat, sing songs, and have a good time generally. This thing of planting trees we can not be too enthusiastic about. Let us plant forest trees, fruit trees, and all other trees. When I went to Moore's Hill I found four or five tons of bones in a slaughter-yard, and obtained permission to take them to my farm. I had them pounded up, and in planting my orchard I placed about half a bushel of them under each tree. My trees have grown splendidly; everybody admires them. A friend of mine got the same list of trees, and planted them at the same time. Now my trees are three times as large as his. I think the phosphates are contributing largely to their growth. I give them a gentle washing off about every month with soap-suds, making the suds very strong in winter and weaker in summer.

I. C. Ferris, of Seymour.—The idea of planting an orchard is a very common one with almost every one that has not an orchard over the country; but in order to make them the most profitable, for individual planting, men must use their eyes, and find what varieties will succeed best in their localities. In failing to do this, many make great mistakes in planting. More is to be considered in the selection to make an orchard a success than there is in the planting. You may go through Southern Indiana and plant it all in apple trees, and unless you have made a judicious selection, you will not have much fruit. Agents come through there with their fine pictures and illustrations of different varieties, and many persons are selecting trees

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from them which will be almost worthless. Men should use their eyes in the selection; find out what one-tenth of the varieties are that bear every year; plant these trees, and you will have an orchard that is a success.

In reply to questions respecting the cultivation and value of the chestnut, he said he considers its cultivation very profitable. He raises the large Spanish, as well as other kinds. Chestnut trees will grow large enough to make six or eight rails to the cut in eight years. They will average a rail per year for eight years. They come into bearing and bear abundantly in eight years, if planted in good soil. The chestnut is a more durable timber than oak; it makes better posts, and lasts better in the ground than oak. Next to it for durability is the black locust. Along the Ohio and Mississippi railroad they are now using chestnut and locust for telegraph poles. I do not know whether the chestnut will succeed this far north or not. They do not winter-kill with us at all.

W. H. RAGAN.—I would refer to Mr. Ferris' remarks as corroborating my own opinions. We should select as well as plant. In Illinois they recommend, as shrubs, elder, spice bushes, and all such planting as that. Such I aim to discard. Mr. Cotton says he would not destroy the most tender shrub. What would our State be if these principles were carried out? There are trees that we ought *not* to recommend to *any* man. These extravagant recommendations are what I wish to discourage. I by no means discourage tree planting, but I wish people to select good varieties.

R. VAILE asked how far north chestnuts can be grown.

DR. FURNAS adopted the views of previous speakers on the cultivation of the chestnut; says he has found them bearing only three years after planting, but in general they do not bear a very full crop till six or eight years old. There is this difficulty in raising them for the fruit: some are hermaphrodites, and are not independent bearers. These, however, can be used for timber.

I. C. FERRIS.—There is a person in my neighborhood who has an orchard of chestnuts, which he considers as more valuable than peaches. The nuts sell at from four to six dollars per bushel at Seymour. Some years the chestnuts bear only partial crops, but in general they yield well. The crop this season was not so good as usual.

DR. FURNAS.—About how far apart should we plant chestnuts?

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I. C. FERRIS.—They should be planted ten or twelve feet apart.

DR. FURNAS.—How would it do, if we want posts for trellises or other purposes, to plant closer, so that they will grow up more slender?

I. C. FERRIS.—It will do well to plant closer, and thin them out as it becomes necessary. I have no objection to the locust as a timber tree, only that it throws up suckers. I do not want anything that is subject to sucker. I have to kill an immense amount of sassafras every year for this reason. The chestnut will not do this. You may cut down an old chestnut tree, and young shoots will run up from the stump to the hight of fifteen or twenty feet in one season. Every one who is acquainted with the chestnut knows that if we cut down fine old trees, which are sometimes five feet through, they will throw out young suckers from the stumps. By trimming these shoots, leaving one, two, or three to a stump, they will grow very rapidly, but while the tree is standing they do not send up suckers.

J. COTTON.—In Virginia the people make their shingles almost entirely of that timber. In Fredericksburg there are roofs, old and moss-grown, looking to have been on the houses for a hundred years, that are made of chestnut. It is considered to be the best timber for shingles.

Mr. DUNGAN, of Johnson county.—I have had some little experience with this timber; I was raised till ten years old where the chestnut was indigenous—in Virginia. There the trees grow to four or five feet in diameter. I have never worked in any kind of wood that was so nice as the chestnut. No timber succeeds better there than it. The climate is about as cold as this. The shingles made of this wood will last as long as a man would want them to. I hardly ever knew of houses being re-roofed in Virginia. Just as great care should be exercised in selecting forest timber as in fruit trees. We have not a very great supply of lasty timber, and we resort to many stratagems to get something more lasty than oak. Those kinds which we consider best in this respect are not very lasty in their young growth. I think the chestnut is what we need. This question should be agitated and talked about till the cultivation of those trees becomes more general. I planted some chestnuts a few years ago, but they all died from the effects of the ants at the roots.

I. C. FERRIS.—There is a house roof of chestnut in my neighborhood that is over thirty years old, and it does not leak anywhere yet

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LAYTON HAWKINS.—I lived, while in Iowa, in the latitude of Chicago. Men there raise chestnut trees which bear to some extent. It is considered that they will begin to bear there at ten years old.

W. A. RAGAN.—When growing rapidly in the nursery they are about as liable to kill as the peach, but when you get them out to growing where they are not cultivated so thoroughly, they seem to be about as hardy as the oak. The first chestnut trees in this part of the country were on Reuben Ragan's place. They were killed down in 1832, but sprouted up, and have been bearing for a number of years; they are fine trees yet. There are some trees a few miles north of Mooresville, in Morgan county, which have been bearing several years, and seem to be hardy. They probably succeed best in oak lands.

I. C. FERRIS.—If the chestnut is not hardy, it is probably owing to the amount of water in the soil. In its native growth it prefers freestone lands, but grows upon limestone formations in some places. At Chestnut Ridge we have sandstone; the soil is well adapted to the growth of the chestnut. The soil is good in that locality, but is rather friable and loose, so that the water soon flows out. The lands are pretty well run down now. The native forest lands produce walnut, chestnut, and sugar tree, all growing together, showing that the soil, where not exhausted, is good.

J. COTTON.—In Virginia the chestnut grows where oaks grow; the soil is clay.

J. C. PHELPS, of Westfield.—We have a few chestnuts in our place, which are about ten years old, that have borne one or two crops. I gathered chestnuts from some trees about fourteen miles north of Indianapolis as much as fourteen years ago. The trees have not grown so rapidly with us as some of those spoken of—still they have made a pretty good growth.

J. A. LITTLE asked if the chestnut can be grown by grafting upon the oak?

W. H. RAGAN thinks it can not be grafted upon the chestnut even, much less upon anything else.

I. C. FERRIS.—I think there is no species of trees but what can be grafted.

DR. FURNAS.—I just now call to memory an article by Dr. Kirt-

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land, of Ohio, in which he speaks of grafting the chestnut as a means of introducing early varieties. There is no doubt about the grafting of it.

W. H. RAGAN.—I am perhaps acquainted with the oldest planted trees in Indiana. They were planted by my father in 1827. Two of the trees are still standing and have generally borne good crops of fruit since my recollection. This year the crop was small. With us trees three years from the seed have ripened well-developed full-sized chestnuts. I have never known the case before—I have not known them to bear usually, under eight or ten years and of a size about three inches in diameter.

I. C. FERRIS.—In answer to the question, What is the best time for transplanting chestnuts said he has transplanted them in both spring and fall. He considers them hardy.

DR. FURNAS.—I think it will not do to plant out very small chestnut trees—such as are sent through the mail, in the fall.

Resolution recommending the cultivation of the chestnut offered by W. A. Ragan:

Resolved, That this Society would recommend the growing of the Chestnut, as a very valuable tree, both for timber and for fruit.

CHARLES LOWDER.—This resolution in reference to planting chestnut trees for fruit and timber is premature. It makes a general sweep of the State of Indiana all over and on all kinds of soils. I wish a reconsideration of the resolution.

Reconsideration carried and pending its discussion. The meeting adjourned.

AFTERNOON SESSION.

Reconsideration of the resolution recommending the chestnut entered upon.

CHARLES LOWDER, opened the discussion. We will all recollect that our former President Nelson was very careful always to advise this Society that we *go slow* in recommendiug things to the people, considering that we had better be too slow than too fast. It was his idea that recommendations that go out from this Society as official should be looked upon as being good authority. They should be

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such as we would not "go back" upon, and such as would not mislead the people. He thought that we had better let the people get their information from some other source than to be deceived by us. I do not see why we should recommend to the people of Indiana, to plant the chestnut indiscriminately everywhere for the purpose of raising timber and fruit. It seems to me that it would be very premature for this Society to go forward at this time in this matter, with our knowledge of the chestnut and its success as a growing tree, as a timber tree and as a fruit bearing tree. If it is to be recommended to everybody to plant the chestnut it seems to me that we might recommend a great many other trees with the same propriety—the black walnut, the hickory, &c., of which we know more as a rule over the State than we do of the chestnut. Of course we recommend no other at this time, then we put it in the lead of all forest trees, and the only one that we recommend for the purpose of growing timber indiscriminately over the State. I hope the resolution will not pass.

I. C. FERRIS.—Gentlemen can readily discriminate between the hickory and the chestnut. We may safely recommend the walnut as a valuable tree for its timber, it is more lasting than that of the hickory; but to recommend the hickory in comparison with the chestnut would be absolutely absurd. I have chestnut rails on my farm which have been made perhaps for forty years, and they are yet sound while hickory rails would not have lasted one-fifth as long. I think this Society can safely recommend the chestnut as being universally adapted over the State to dry uplands, and as being more valuable than the walnut for the general purposes of the farmer. Its lumber would not sell for so much in market, but as a rail timber, for posts, for lasting timber, it is of much more value than the walnut.

I. D. G. NELSON.—It has been known in our neighborhood for thirty years, but not sufficiently to know what it would do as a timber tree. In many places it is used exclusively for rails. There is a trouble about this, as well as other nut-bearing trees, it has a tap-root, and as it is a dangerous experiment to sever that root the tree is transplanted with some difficulty. I would not be willing to recommend it for general cultivation without further trial. I think it will stand the winds of the northern part of the State, as it is a perfectly hardy tree. It grows as far north in New York as I know

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anything of the State—it is used exclusively for roofs along the Hudson river.

DR. BROWN.—I have seen it growing near Brattleboro in Vermont. But I fear it will grow too rapidly in low lands and from this cause be liable to winter-kill. It usually grows on very thin soil.

J. COTTON.—There is no dispute about the excellence of the wood as a farm timber, it is only as to its being hardy here that there can be any question. It has been stated here that it is, even in its growth, adapted to our soils. I hope the resolution will not pass.

The vote was then taken on the resolution, and it was lost.

J. A. MENDENHALL, offered as a substitute the following, which was carried:

Resolved, That we recommend the Chestnut tree for trial both as regards fruit and timber.

DISCUSSION ON FRUIT TREES AND FRUIT-BEARING PLANTS.

DR. BROWN.—In regard to fruit raising the first thing with everybody, professional and amateur, is to get the kind of fruit you want. This has been one of my greatest difficulties all the time. Now I wish a satisfactory answer to this question. By what means can we secure greater certainty in obtaining the varieties that we desire, from our nurseries? I have been striving to get certain varieties of grapes, pears and other fruits for several years. In my efforts to obtain a Herbemont grape vine, I have failed in four cases. In three cases I have similarly failed with the Louisa Bonne pear. I got my stock from our own nurseries; of men who are responsible for their being the right kind; whenever I go back and say this is not the kind I wanted they give me another—when I tell them that *this* is not it, they replace it; but it is wasting too much time. The question is how can we get the right kind the *first* time? This is the beginning point of this discussion.

S. BURNETT, of Vincennes.—There is one way that the Doctor can get the kind of trees he wants: Let him find a pear tree of the sort he desires, get some grafts off of it, and graft it himself, or get some

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nurseryman to graft it for him. Let him cultivate it from the graft, and it will bear the very same kind of fruit as the tree from which it was taken.

Dr. Brown.—All the use we have for nurserymen in the world is to save us that trouble. We can raise stocks; but the question is: How can we get the varieties we want without being at the trouble of turning nurserymen ourselves? I do not say this for the purpose of censuring the nurserymen; I think they do not wish to deceive me. Even our worthy President, intending to do me a favor, made me a present of a rapidly-growing grape, which grew well, but when it bore it did not bear Delawares. It bore some black grape with a thick skin. I showed it to him, and he told me it was the York Madeira. He did not wish to deceive me, neither did the other men. Their stock was mixed. They had to obtain their stock from some source, and in doing this there was a slip somewhere.

Dr. Furnas.—Such cases will occur always more or less, with all the care that can be brought to bear upon the matter. I got my stock of Delaware grapes from John C. Teas, of Raysville, in a large lot, which succeeded well, but inadvertently there was among the rest one York Madeira. Their leaf is quite similar. I had to use the wood of the Delaware closely at that time, and by some means I got one of this kind. Of course I sent it out to others since the nurserymen sent it to me. The remedy of my friend Burnett is the correct one, but it is sometimes attended with considerable labor; yet the trouble of regrafting is not a very great one. I can turn a pear stock of almost any ordinary thrifty growing kind, and in three years grow Bartletts on it.

Dr. Brown moved that we take up the subject of the durability of orchard fruits for discussion. Carried.

Dr. Brown.—It has been observed all over Indiana, Illinois, and a good portion of Ohio—it has been observed of orchards *generally*, that our fruit trees are very transient. In many places the duration of our orchards is such that it makes it almost worthless to attempt to produce trees. We plant orchards, and they come into bearing early; they grow rapidly on our soil, and bear three, four or five crops of apples or pears, begin to decline, and a few years finds our trees dying. One by one they pass away, and at the end of twenty years we have no trees left. Now, this is the history of hun-

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dreds of orchards all over this upper plain of Indiana. It is not so much so among the hills on the river, or on the eastern border of the State, towards Lawrenceburg, for there are some old orchards still in bearing in that part of the country, but as soon as we pass to the great plateau of Indiana, this complaint of the short duration of the trees meets us everywhere. Last summer, I went six or seven miles to look at an old orchard, in Fayette county. I remembered it forty years ago, when I was there practicing medicine, as a large bearing orchard at that time. It is situated on a hill, principally on a hillside slope, with a central drain through it. I saw there two fine apple trees of grafted fruit, in good bearing, full of apples last year, that were planted in 1812, and they are yet growing vigorously. There was one pear tree that particularly attracted my attention. I did not have the opportunity of taking its exact height, but, judging from the best observation I could make, it was about sixty feet high. The top is pyramid-shaped. The trunk belted six feet and two inches about two feet from the ground. It has failed to bear pears but three years in twenty. It was still growing as vigorously as a young tree. I measured one apple tree, a White Winter Pearmain, which had perhaps thirty or forty bushels of Pearmains on it at the time, and it girted nine feet four inches two feet above the ground, making it a little more than three feet in diameter, yet it is a vigorous, sound tree now; while of the trees first planted on the central plateau, you can hardly find one that is sound. Now, what is the reason of the short livedness of our orchards in Central Indiana and Central Illinois? When we approach the northern lakes the trees do not seem to die so rapidly as they do here. I have been investigating the problem for some time. The first difficulty with us is the fact that all this clay upland of ours lies upon a compact, tight bluish-yellow subsoil, into which the roots of the apple trees penetrate but poorly, and in which the water stands six months out of twelve. If you dig three feet deep in that ground any time from October to May, signs of w r will be found. The roots of the apple tree will not live in such a saturated soil. Our apple roots then must lie upon this subsoil or above this saturation, and on a great deal of our land this saturation extends nearly to the surface, consequently the roots are spread out near the surface, subject to injury from the changes of the temperature. There comes a hot, dry summer, in which the surface of the soil becomes as dry as dust down to a depth of two or three feet, killing all the rootlets that are in active operation in these upper parts. A

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severe winter follows, which freezes the surface, the accumulated water in the spring kills the roots below, and the tree dies. There are many auxiliary causes no doubt, all tending to destroy the tree. The growth of the tree may be too long protracted; it does not mature its wood sufficiently, owing perhaps to the fact that from drouth or other cause it can not grow properly at the right season for growing; the September rains start the tree into a new growth again to be caught by the coming winter.

S. BURNETT asked, if the root rot, that is so prevalent in Illinois, and to some extent in Indiana, is to be attributed to the same cause?

DR. BROWN.—I think it may be.

S. BURNETT.—Where my orchard of a thousand trees is located, the subsoil lies upon sandstone rock, that comes to within three feet of the surface, and my trees have been affected as the Doctor speaks of. I have found, also, that in the growing season the leaves here and thereupon the trees turn yellow. Upon examination, I found that the tree was sickly, and a gust of wind would blow it over. The small roots were entirely rotted off. I have not been able to satisfy myself as to the cause, but I think the Doctor's suggestions very reasonable.

J. COTTON.—I think the remarks made last night, with reference to the pear, apply fully to the apple. My observation is that drained lands are best for all kinds of fruit trees. On our clay subsoil the rootlets extend down to this stiff clay, where the water accumulates, and the tree is checked in its growth; but where the land is drained, by throwing up or tilling, the tree flourishes. We have a very good orchardist in our neighborhood, who has thoroughly drained his land, placing the tiles not nearer than within twenty feet of the tree, as if placed closer the roots will reach to the tile, and eventually obstruct the passage of the water. His trees are the best we have in that country; they are growing right along, not an unhealthy tree in an orchard of five hundred.

CHARLES LOWDER.—We would infer from the remarks of Dr. Brown, that the only way to avoid this killing of our trees by the wet would be to underdrain. While we are on this subject I want to call the attention of the members who were here last year to the remarks of Dr. Hull on draining, when commenting upon the essay on pears. He denounced underdraining, as a protection to orchards, as a waste of time and money. I recollect distinctly some of his

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remarks on that subject; among them, he said that in wet clay lands, such as we have in Indiana, if tile was put down to any depth, even to three or four feet, out in the row, the roots of the apple trees would run out into the tile, and eventually fill it up. He spoke of seeing them taking up these drains in Michigan; they were completely filled with apple roots so that the water could not pass through at all. My own opinion is to the contrary. I think our only remedy for apple trees or pear trees in wet clay land is to underdrain deeply—then I think our orchards will last as long as those in some of these hilly lands. All our land needs underdraining to a depth of three or four feet. I do not believe that the tile drains will fill up with the roots. Just think of apple roots running off a rod, getting into the ditch, going down four feet, creeping through the crevices into the tile, living there on nothing, and filling it up! I think those drains must have been filled up from some other cause; there must have been some other roots there.

Dr. Brown.—In regard to underdraining, my observation leads me to this conclusion: first, that some roots do during the wet part of the season, early in the spring, form clusters in tile. I have seen some of these clusters that are curiosities, but all that I have ever seen were elm or willow. I have seen the roots of no other plants obstructing the tile. I have seen tile taken up in orchards where they had been for six years, within ten feet of the trees, and no apple or pear roots were found in them.

I. C. Ferris.—This subject deserves considerable attention at the hands of this society. There is no doubt but that my friend is correct as to what is destroying our apple and pear trees in a measure. On these high table lands the want of drainage is undoubtedly causing their short life. We attribute to the very thorough manner in which nature has prepared our lands by drainage, on Chestnut Ridge; the fact that there we can grow peach trees until they are thirty, forty, or even fifty years old, standing right in the blue-grass sod, where in any other peach lands they would have died in three or four years; there they stand, and look as though the ground had never been cultivated. I have cut down seedling peach trees that were thirty years old, and eighteen inches in diameter; apple trees also live to an old age with us. This season has been one of some misfortune to us. Pear and apple blight showed themselves to some extent. One year ago when our society met, we had a long disertation on root-pruning as a preventative of the blight; so we

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went to root-pruning, and commonly, the trees that entirely died of pear-blight were those that I treated with root-pruning. This effect I attribute to the location and the variety. Those on northern slopes were uninjured while those on the south died.

I think fire-blight is not always caused by freezing, as I have seen trees die of blight before fall that had come up after frosts in the Spring. Fire-blight is not a respecter of persons when it makes its appearance in a severe form. I can not conclude that freezing or thawing has anything to do with fire-blight. I have observed this season upon my pear trees that wherever fire-blight has shown itself, the branches are affected below where you would notice the effects of the blight; the bark seems to die and you will find a species of fungus growing upon the bark. I have made some experiments with sulphur. I am not certain but that we may find a remedy in sulphur yet. I have experimented enough with it to come to a satisfactory conclusion. I wish the members of this society to try this remedy. If you notice the branches below where the blight appears to the causal observer, you will find a species of black mildew before it shows itself in the leaves. The result of my investigations goes to convince me that fire-blight is the result of atmospheric causes, that act about the time the blight is beginning. The excessively hot weather early in the season of 1847 was followed by the appearance of the fire-blight in both pear and apple. So it was this last season. I believe the causes are atmospheric; the same as the cause of the fungi that attack the grapes. The wood of my trees was well ripened last fall a year ago. The trees made no extraordinary growth. My pear trees had already shed their leaves at the time of the cold weather. It is a peculiarity of Chestnut Ridge that the trees do no grow late as in some other soils. The blight of the pear demonstrated itself upon seedlings after the frosts of spring were done and before the frosts of autumn, but it was just as complete as it was in trees which were older and larger.

I. P. Evans, of Richmond, asked if those fruit trees that had lived to an advanced age have not been grafted in the stock instead of in the roots; and whether any nurseryman has observed any difference in the life of trees so grafted, and whether any difference has been noticed in their times of coming into bearing.

J. C. Ratliff, of Richmond.—From my own little observation, I am of the opinion that trees grafted in the root, do not and will not bear as soon as, nor as extensively as those grafted in the stock.

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So well satisfied am I of this fact that I would pay double the amount for trees grafted in the stock that I would for those grafted in the root. In our part of the country we have orchards from ten to sixteen years old, nice vigorous trees cultivated and taken care of in the most perfect manner recommended in the books, yet there is no fruit. I planted an orchard eight years ago next spring, of three year old trees; have kept the soil exhausted as much as possible, so as not to encourage a too rapid growth; have taken as good care of them as I know how, and the result has been a handful of knotty, indifferent fruit. I attribute this result to the trees being grafted in the root only so far as the yield is concerned. My neighbor has an orchard of one hundred and twenty-five trees, fifteen years old; that is said to be the finest orchard in Wayne County; he says he knows trees grafted in the root will not bear well. I can point out a half dozen orchards of fine trees, all of them large, and there is no fruit; but come to the old orchards where the trees have been grafted two feet and upwards from the root, you will find fruit, and nowhere else; whether the manner of grafting is the cause or not I can not say. My father had a tree grafted in the stock and in five years from the graft it bore five bushels of apples. His trees are sound, healthy and vigorous; you can see the very place where they are grafted in most of them, being two feet and up as high as a man's head. That orchard has never been known to fail to bear a few apples. I have become satisfied that there is something in the root grafting system that prevents the tree from bearing, but I will not attempt giving a reason for it.

J. A. MENDENHALL.—I would be glad if the last speaker would go to my orchard and tell me why my trees that were grafted some distance above the ground do not show so many apples as those that were grafted in the root.

I. C. FERRIS.—On this subject I am just where I was several years ago. I do not believe that more than one tree ought to be made of one stock. I think the nature of the soil has more to do with bearing than the manner of grafting. A man came into my nursery a few years ago and said to me, "Look here, Mr. Ferris, I want three hundred Smith's cider apples;" "You want three hundred Smith's ciders?" "Yes." "But that would spoil the assortment, can't you take some Rhode Island Greenings, Spitzenbergs, &c.?" "No! I want three hundred Smith's ciders." On asking the reason, he said that he had a few trees of that kind which

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had been in bearing nineteen years, and they had given him eighteen crops of apples. This was the very reason why he wanted so many of the same kind. Another case of the same kind came under my notice with the Rome Beauty. Now if my friend will observe just what trees bear in his neighborhood, and get these kind that fruit regularly, it does not matter so much whether they are root grafted or not. I would condemn the practice of making too many grafts from the same scion. There is a vital point, and about that point is a good place to insert a graft. About one graft to a stock is enough. My observation goes to prove to me that if I want an orchard to be a success, I must notice what kinds are the successes in my vicinity. I know an orchard that bears abundantly every year, another by the side of it bears very little; the difference consists in the selection of varieties.

J. C. RATLIFF.—I am satisfied that location has a great deal to do in this matter. I am also satisfied that there are certain varieties of fruit no matter how grafted, that will bear, if there are any kinds that will bear under the circumstances. The orchard to which I referred, consists of varieties, such as are well known to be reliable fruits. I pride myself upon getting up as near the selection that my father had, as possible, and with him they were always successful. I have all the good bearing qualities in my selection that I could get, yet, still I get no fruit.

I. P. EVANS.—I have some sixty or seventy apple trees, that were set out in the spring of '56; they are thrifty trees, many of them will measure eight inches through, yet I have not had apples enough off of them, to tell whether they will bear the kind of apples they were represented to be or not. A neighbor that lived within a mile of where Mr. Ratliff's father does, told me that when he settled there, he got some seedlings, set them out, and the next year had them grafted, and they soon came into bearing. A few years ago, a storm came through, destroying his orchard. He tried to replace them with the same kinds, but though they have been out several years, he has obtained no fruit. Trees that were planted years ago, when they were grafted hardly any other way than in the stock, came into bearing early, but now we find that we have to nurse our trees for several years before we get any benefit from them. Trees grafted in the root, are liable to be broken off just below the surface of the ground; this is particularly the case with dwarf pears that have been grafted on the quince.

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J. RODKEY.—I have been of the opinion for years, that the cause of the trees not bearing, whether grafted on the stock or in the root, was from the fact that the cuttings were taken from the nurseries, from trees that had never borne, or from water sprouts on old trees. My plan has been to take the cuttings from the ends of the limbs of bearing trees, and I have had no trouble in bringing my trees into bearing.

DR. FURNAS.—Suppose that we should adopt the plan of cultivating trees wholly by grafting, or budding high up, we would run risks that must be apparent to every one. In seedlings, we are liable to get every kind of stock, and we do not know whether it is going to be a hardy or tender; it would not do well to put a hardy variety on a tender stock. This is an objection to that way of raising trees. But if we have a hardy stock, there is no objection to it, except that it is more tedious. In one point of view, it is the decided preference. Take such trees as have hardy stocks and put the grafts up higher, and they will succeed better. Any man that digs trees, or that has observed tree digging, knows when he has a certain lot of trees to dig, whether this kind is hard to dig, or whether that is easier. Pryor's Red is dug up easily; the root is straight down with little or no fibres, no matter how grafted, but take a Yellow Bellflower, and if the tree is four years old, he may expect a good pull on the spade; the root is well developed—could not be better. The root is strong or weak in proportion to the hardiness of the variety. Then if you take a tender variety and put it higher up, you may chance to get a hardier stock to put it on; at the same time you run the risk of hitting occasionally, a very tender one that might have made a Golden Russet, a Pryor's Red or something else. If you take a root of any variety and graft it into a Pryor's Red, the root assumes the characters of the roots of that variety. If you will take and layer a Pryor's Red, and start a tree in that way it will have these poor roots, or if you take a Bellflower it will have the same roots that it would have if put on a root stock.

In reference to taking grafts from bearing trees, I think there is something in it, but not so much as some think there is. I have Wagener trees grafted in the root which are beginning to bear freely at two years from the graft. I have Ben. Davis trees which are bearing at two years from the set.

Almost all those people who talk of their trees being so long coming into bearing, the trees being thrifty, and growing well, will

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find that when they get over that they will bear some yet. They can not make much wood and bear at the same time.

T. MONTGOMERY.—We had the idea advanced by the Illinois Horticultural Society a year ago at Ottowa, that you must go East for your scions—that you can not find healthy trees in the West. Mr. Dunlap once gave it as his experience, that you might graft from the water-sprout, from the tip of the limb or anything else, if you grafted in well developed ripe wood.

I. P. EVANS.—My trees that have borne came from the East while those that have not, came from the West.

W. A. RAGAN.—It is owing to circumstances altogether about the part of the tree from which the graft is taken.

Graft trees up like the top grafters used to in this country, and you will get fruit in two years from the graft. Thus you get fruit quicker than by grafting in the root. But there is one thing certain and all nurserymen will bear me out in it, that trees which are grafted in the smallest roots, make better, thriftier and healthier trees than those grafted on larger stocks. We know a healthy tree will not bear as quick as a sickly one. A tree of which the inside is dead, that is ringed around, knawed around by the rabbits, or killed at the ground by the winter, will bear quicker than a healthy tree.

Healthy trees make a growth of wood and do not prepare so much for the fruit when young as those that are in a sickly condition. Trees grafted in small roots will throw out roots from the graft, making the whole tree of the same kind as the graft. As a general thing, you may graft young wood, if put on healthy roots, and the orchard will come into bearing as soon and bear as much in the same length of time as if put in higher up.

The report of Committee appointed last year to make a list of all the apples grown in the nurseries of the State was called for.

I. C. FERRIS said that the part of the committee to which he belonged had found it an arduous undertaking, as some nurserymen have a hundred varieties on the list. I think this is ninety too many. I have made a list of about ten varieties; I think this is

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about as many as ought to be planted in the Southern part of the State. I am satisfied of this from my own observation. Those that I would recommend for the Southern part of the State are the following: Jersey Black, Janet, Smith's Cider, Rome Beauty, Milam, Tulpehocken, Winesap. These varieties have all succeeded well, usually bearing almost every year; this year was more nearly a failure than others. The Jonathan apple also bears well with us. The Fulton, of Illinois, has been in bearing four years in that vicinity, and has given three good crops. There are some two or three other varieties that I am satisfied will be well adapted to that part of the State. The trees have fruited in the nurseries at three or four years old. Grimes' Golden Pippin we have not fruited yet.

DISCUSSION ON MARKET VARIETIES OF APPLES.

J. GILBERT, of Terre Haute.—In reply to a question with regard to the Hoop apple said it is undoubtedly a good market apple. It has proved so with us. There are not many orchards of that kind, but it has been planted, it has proved to be a good market apple. I have trees of that kind which have been growing for forty years, and they have given many good crops of fruit. Every second year there is none at all in the orchard. This year six trees had ninety bushels of apples, all first-rate. It is a good keeper—not the best quality, but a good apple; like all other apples they are not keeping well this season. It is a first-rate market apple for money.

S. BURNETT.—In summer I have found more profit from the Golden Sweet than any other. I have the Red Astrachan, the American Summer Pearmain and some other sorts. The Golden Sweet carries to market well, and always brings a good price. For winter I have found more money in the Wine Sap than anything else. Rawls Janet has heretofore rather led the market. It is not a first-class apple, and as you know has a short stem, grows in clusters, and where they hang together on the limb are liable to rot. The Winesap has a long slender stem, hangs loosely like cherries, and keeps well. The yellow Bellflower always brings the best price in the market, but the trees are not to be depended upon for bearing as much as some other sorts. They are rather shy bearers,

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though one year I had eleven dollars worth from a tree ten years planted. But they are not to be depended on for a constant bearer. Pryor's Red is an excellent apple, but the leaves rust and the fruit fails to mature. It is small and the tree is diseased. The Vandever is a good apple—sells well in market, but with us is not a winter apple; it matures in the fall and must be disposed of soon. I have found that the way to realize the most money out of my fruit is to sell at once when ready for market, no matter what the price is, do not hold it. My apples brings me more money when I dispose of them in the fall. If I can sell them in the orchard I will do it. If I can not sell them I do so as soon as I can afterwards, as I can realize more money by doing so than by holding them till winter, though I might get a better price at that time, for there is a loss by specking and handling. I have the Rome Beauty in bearing but only on small trees. The Ben Davis promises well; Baldwin's are tender and winter-kill; Smith's Cider is first-rate—it is a good bearer—it is a good apple—it is "number one." The Jersey Black I have not in bearing. Smith's Cider classes as a "number one" apple for market.

W. H. RAGAN.—I have found for a number of years that it is best always to sell fruit from the orchard, unless it be in the case of those who are near market where they can run in at intervals during the season. When we take into consideration the greater handling, and the necessary loss, it is better to sell from the orchard, even though a greater price could be had later. It is a very important matter to fruit growers to know when to sell their fruit to be most profitable to them. I never intend to put up fruit hereafter for sale. Mr. Burnett is almost right on the varieties. The Winesap, however, is not our most profitable variety here, although old and well known; like the Rhode Island Greening, and some other sorts, people know it by name; but the quality probably gives it a better name than it deserves. I would take Rawl's Janet in preference. The Ben Davis we think will do from several years experience. Rome Beauty is another valuable variety. McAfree's Nonsuch I do not consider a profitable variety.

J. A. MENDENHALL.—The first question with everybody who think of planting trees for market purposes is, What kind of apples *pay* in my neighborhood? What kind of apples do my neighboring friends get their most paying fruit from? I want to impress this idea upon the members, and let it go abroad if any persons

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are thinking of planting apples for market purposes. It is impossible for this Society, or any other, to say what varieties will do well here or there. Some varieties do well some places while in others they are almost worthless.

J. COTTON.—We have a new apple in Dearborn county named Newbank's Seedling. Dr. Warder has examined it and passed judgment upon it very favorably. It is a medium apple, very sound and healthy. Amateurs have pronounced it excellent in quality. Our folks are enthusiastic about it. Mr. Ward is cultivating it; I expected he would have had some of the apples here. I do not know certainly of its market properties, I think it will ship well. It is a showy and pretty apple.

I. C. FERRIS.—In regard to market varieties of apples, beginning with the season, I believe the Benoni is one of the most valuable. The Golden Sweet is evidently one of the most valuable varieties that can be grown for market. Then Maiden's Blush and Porter are good bearers and profitable varieties. For fall apples the Rambo, with us, seems better than any thing else. For winter, Smith's Cider is one of the best. I believe the Jersey Black and Ben Davis can be confidently recommended to plant universally.

J. C. RATLIFF.—About two months ago, while passing through the markets of Washington, Philadelphia, Baltimore and New York, I was astonished at the immense quantity of fruit; I saw not less than two hundred bushels of one kind in the market at a time. The principal varieties were Pound's Sweeting, the Alexander, and another kind that resembled the Black Gilliflower. It seemed to me that every single dealer had an immense quantity that he could not dispose of. It was perfectly astonishing.

J. RODKEY.—This last fall a year ago our heavier crops were most generally Baldwin, Newtown Spitzenburg, Roxbury Russet, Smith's Cider, Tulpehocken, and likely a few other varieties. The Jersey Black bore such a full crop that it apparently did not make any fruit buds this last season. With the exception of the Jersey Black I probably had one-fourth of a crop in my orchard this season. The White Winter Pearmain, a variety that had done little good for several years was loaded. I have become satisfied that we want more than just a few varieties. What will fail this year, it is likely will hit another. I want a few more than some who have been speaking about it.

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W. A. RAGAN.—Called attention to the Clayton apple. It is an apple that bids fair to be a fine market fruit. In size it is large—is a fine keeper—keeps as well as anything we have. The tree is healthy and a vigorous grower—very hardy—easily cultivated, and comes into bearing early. The fruit has been generally fair and fine. Last spring I sent a box of it to the best fruit growing district in western Missouri. I had letters from there since saying that if I would send the trees there I could sell them at extra prices. They were pleased with the quality of the fruit. You will find it in Dr. Warder's Fruit book. In every respect except quality it is "number one," and in this it is much better than the Ben Davis, and the tree is a more vigorous grower. The Ben Davis is one of our best market apples and probably will pay as well as any other. I do not know that the Clayton will be better but I would prefer it so far as I know. Smith's Cider is third rate in quality yet it will probably make as much money for us as any we have. Some apples are very good but we can not raise enough of them to make money off of them. The Clayton seems to succeed in all kinds of soils so far as tried. Some condemn an apple in one section of the country and some extol it in another. Some apples succeed well everywhere. The Yellow Bellflower on some soils does well, on others it makes all leaves and wood and no fruit. On certain soils and some localities the Rhode Island Greening is fine—nothing will excel it, on other kinds of soil it will do no good. The same may be said of the Vandever Pippin, and many other apples. We should not discard an apple because it does not do well with us. Many things must be taken into consideration.

Notwithstanding the Rambo does not stand high as a market apple, I believe it is worth more than any other we have. It bears everywhere abundantly. The apple is good—one of the best to eat, and if gathered at the proper time before it is mellow and put away in a cool dry place they will keep all winter. No apple will pay better than the Rambo. The tree is healthy, a good grower, bears early and the apple is good. I have cultivated the Rambo and seen it cultivated but have never seen it killed.

J. G. HEINL.—The young trees of the Rambo are sometimes injured very much.

WM. PATRICK, of Terre Haute.—I have found that the scions are not injured on bearing trees—last year they were hurt on the young trees.

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REPORT ON ENTOMOLGY AND ORNITHOLOGY, PREPARED BY DR. LEVETTE.

To the President and Members of the Indiana State Horticultural Society:

GENTLEMEN:—Having been advised, early last summer, that Dr. R. T. Brown, J. C. Ratliff, and myself had been selected, at your last annual meeting, as a committee on Entomology and Ornithology in the central part of the State, to report at the January meeting in 1871—and hearing nothing from my fellow-committeemen on the subject—I respectfully submit the following brief notes, regretting that want of time rendered a more extended report and more thorough and careful observation impossible.

In the early part of summer, the currant bushes in and near this city were in many instances badly attacked by the Currant-bush Borer, the larva of a small moth technically known as *Trochilium tipuliforme*. This insect is not a native, and, like a majority of the imported pests, has proved far more destructive than our native species. The larva bores into the pith of the stalk, and after feeding to maturity, changes to a crysalis, and in that condition awaits the following spring to develop the moth, the crysalids may be destroyed by cutting off all the dead stalks or branches in early spring and burning them.

But a much more to-be-dreaded enemy to the currant and gooseberry bushes is a pale green worm, the larva of a saw-fly (*Nematus ventricosus*), this fly is double brooded and the larva are such ravenous feeders that an infested bush, at first showing no signs of the enemy, will in two or three days be entirely defoliated if not checked by artificial means, as yet it is but little known in this vicinity but will doubtless increase in numbers until the greatest vigilance will be required to secure a crop of these berries; sprinkling the infested bushes with a decoction of powdered hellebore, or dusting the dry powder over them, is the most effectual remedy now known. The efficacy of hellebore in the destruction of this pest is fully demonstrated by the following experiment of W. Saunders of London, Canada; he writes to the Canadian Entomologist as follows: "When on visiting my garden again on the 19th of August, I found many of the bushes entirely leafless, and the foliage remaining on the others was rapidly disappearing. I felt discouraged and began to have misgivings as to whether hellobore was, after all, such an unfailing panacea for this almost universal pest, as we had supposed. I resolved if possible to satisfy myself fully on this point, and having mixed about one-and-a-half ounces of powdered hellebore with a pail of water, was ready to proceed. I selected a leaf from two bushes, marked them and counted the number of their inhabitants—one was occupied by *forty-four* worms of different sizes, crowding it above and below, and it was about half eaten; the other leaf had twelve nearly full grown on it. Having transferred the mixture of hellebore and water to a watering-pot, the bushes were sprinkled with it. I returned to examine the result in three-quarters of an hour, and the leaf which, at first, had forty-four on it, had now only two, and these were so far exhausted that they were unable to eat, and could hardly crawl, while on the other leaf, out of the twelve there remained three, but in the same enfeebled condition. All around under the bushes, the ground was strewn with the fallen foe, and I felt perfectly satisfied that entire reliance might be placed on this means of defense."

Mr. S. also tried sprinkling the bushes with hot water, and found that it brought the larva quickly to the ground, but did not prove fatal to any considerable number, they quickly recovered and if not destroyed would soon crawl on the bushes again.

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Their increase may be wonderfully crippled by carefully examining the under side of the leaves for eggs, it requires a strong light to enable one to see them, and stooping among the bushes with a hot sun overhead not being the most pleasant employment, most persons would likely prefer the application of hellebore to the feeding larva.

As this fly, like the currant bush borer is an imported insect, I would recommend a strict observance of the suggestions of the late B. D. Walsh to persons bringing currant or goosberry bushes from a distance, viz.: be particularly careful before planting, to wash the roots thoroughly and scald or burn whatever comes off them. By this means any crysalids that may be secreted in the earth attached to the roots will be effectually destroyed; this plan is easy and simple and if observed, as a rule, by all persons planting bushes or trees brought from without the neighborhood, it would be thoroughly effectual against the introduction of insect enemies from abroad, and confine originally local species within narrow geographical limits.

The failure of the apple crop, the past season, in the central and southern parts of the State, was in a large degree chargeable to the depredations of the codling moth (*Carpocapsa pomonella*), fruit enough escaped the late frosts of spring to furnish food and shelter for a sufficient number of the larva to secure an army of moths in the coming spring, and orchardists who did not during the pest season encircle the trunks of their trees with rag or hay-band moth traps, and attend them properly, will, I fear, find the moth as abundant next summer as thought the past had been a prolific fruit season. Should the fruit be winter-killed or destroyed by the late frosts, this flourishing condition of the codling moth will not be noticed, if the tree gives no promise in early summer, nothing will be expected at the gathering season, and it is only when seasons are favorable to an abundant promise of fruit that the depredations of insects are most felt, observed and talked about, and it is probably as wise to practice preventive measures during seasons of poor yield as during seasons of plenty.

As this moth is double-brooded in this latitude, the first brood attains full size before the fruit comes to maturity, and, as the fruit drops prematurely and before the larva is fully developed, the second brood may be materially diminished by careful daily gathering all the wind-falls and feeding them to hogs; or, a less laborious and equally efficient plan, would be to keep a drove of hogs in the orchard from the time the fruit is set until the gathering season. Apples generally attain such size before the second brood of larva bore into them, that they seldom drop much before those not attacked, and are often gathered and housed with sound fruit, thus unintentionally but carefully fostering an enemy to destroy the next season's crop.

The most approved remedy is a band of hay or rags, securely wound around the trunk of the tree, so the escaping larva when crawling up or down in search of a secure retreat in which to spin their cocoons, may find beneath, or in the folds of this band, just the conditions sought for; at least once every two weeks these bands must be removed and old cocoons destroyed.

With those who have extensive orchards, and wish to do up the work of destruction in a hurry, the plan of Mr. Brown, of St. Joseph, Michigan, may meet with approval, he recommends bands of rags, not hay, placed around the trunks of the trees, near the forks, and once in every two weeks go over the orchard with a clothes-wringer, remove each rag from its place, and pass it through the rolls, this would effectually destroy all larva or crysolids secreted in the folds of the rag; but a careful examination of the trunk of the tree immediately beneath the rag would be necessary, as the larva frequently constructs its cocoon on the bark and attached to it, and would be left safe and unharmed while the rag was passing the intended fatal rolls.

During the latter part of the past summer, the foliage of the apple, pear, and

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cherry trees in this vicinity, and more especially in the southern part of the State, suffered from the poisonous punctures of the Tarnished plant-bug (*Capsus oblineatus*), scattered over the trees were little bunches of dead leaves, having a scorched or burned appearance; the twig is poisoned by the bug when puncturing the bark to suck out the sap; the leaves beyond the puncture soon die, and assume the appearance just stated; in some instances the twig dies, perhaps in such cases where the bug has made several punctures near together, while in many cases the twig survives the shock and continues growing the next year; in the latter case, the punctures being fewer, the poison is soon distributed by the circulating sap, and so diluted as to lose its fatal effect. Every summer, more or less of them may be seen, but they were unusually numerous during the past season, and frequent were the inquiries as to the cause of the "blight" on apple, pear, and cherry trees. C. V. Riley, of the American Entomologist, after carefully observing the effect of several supposed remedies, indulges no hope of coping with this despoiler, only by shaking off the bugs early in the morning before they fly readily, and destroy them by immersion in soap suds.

The Tent caterpillar (*Clisiocampa Americana*) infested a number of fine orchards last season, and scarcely an orchard within sight of the railroad between here and Terre Haute, but that showed the ravages of this pest; also, between here and Lawrenceburg their silky tents marred the beauty of numerous trees. A common way of disturbing them is to destroy the nest with a pole, and when it is vigorously stirred among the contiguous branches, nearly all the caterpillars will fall to the ground, and when care enough is taken to crush each one before quitting the work, it is a very effectual means of reducing their numbers.

An old sack or rag wound around the end of a pole and set on fire, after being saturated with coal oil or benzine, and held so the flames reach the nests of these caterpillars, will cause them to lose their hold and drop; a few may regain the tree by crawling, but a great proportion of them will be fatally injured by the scorching.

This very conspicuous caterpillar is not much sought after by birds, unless it be by the cuckoos, which (on the authority of Nutall, the ornithologist,) considers them a choice diet.

A caterpillar, very similar in appearance and habits to the one just mentioned, was very destructive the past season among our shade as well as among our fruit trees, the silken webs of this the Forest caterpillar, (*clisiocampa sylvatica*) were very conspicuous among the trees in the State House yard, and in other parts of the city. It does not spin so large a web as the Tent caterpillar; and, instead of congregating on the inside of the web as that larva does, it simply rests on the outside. The same artificial remedies may be applied to both, and their parasitic enemies, we have reason to hope, will, in turn, reduce their numbers until their appearance shall be the exception rather than the rule.

Black walnut trees have for several years, during the latter part of summer, been almost entirely stripped of their foliage by a black worm sparsely covered with white hairs, the larva of the Handmaid moth (*Datana ministra.*)

While feeding they are scattered over the branches and foliage of the trees, but at each moulting all the larva of a brood congregate together in a dense cluster on the body, or some largh branch of the tree within plain sight and easy reach, at which time they may be easily and quickly destroyed by crushing or sweeping off and burning, and each one of these clusters, so destroyed, lessens the numbers in the next generation by many thousand.

The peculiar habit of these despoilers of this valuable tree, of moulting in clusters near the ground, renders their extermination a comparative easy matter, and when so much service can be rendered in so short a time with so little effort, it becomes the

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duty of every one on seeing a cluster of them on the trunk of a tree to halt a sufficient length of time to find a stick or a bit of bark and *rub them out* of existence.

Of all the insect enemies which tend by their depredations to injure and diminish our fruit crops, perhaps no one has been more thoroughly written up and discussed than the Plum Curculio (*Conotrachelus nenuphar*), no other has excited so much attention or so wide an interest throughout the whole country, or enlisted such arrays of talent for its certain and speedy extirpation. It attacks other stone fruits, also the apple, pear and quince, but from its marked preference for the plum it doubtless gets its common name; numbers of our agriculturists, as well as many residents of cities have expressed their willingness to devote any reasonable amount of attention to growing some of the finer varieties of plums, if it were not for the almost inevitable certainty that on nearly every plum that formed on the tree there would be a curculio ready to deposit an egg, the blasting result of which would be more aggravating to the grower than a knowledge that he had made no effort to grow plums, yet after a careful perusal of Trimble, Walsh and Riley, we may be encouraged to combat these little pests by *jarring* the trees, twice daily, from the time the fruit is set until it is three-fourths grown.

Dr. Trimble of Newark, N. J., Dr. Hull of Alton, Ill., and others attest the economy of employing men for the special purpose of jarring the trees and killing the curculio during the fruit season, *shaking* the trees will not accomplish the purpose, but a sudden jar, as by a blow from an axe or large hammer, will cause them to let go their hold and drop, where they may be caught on a sheet spread beneath the tree as recommended by Dr. Trimble, or by means of Dr. Hull's curculio catcher, which resembles a gigantic umbrella, inverted, and attached to a wheelbarrow. Mr. Earle of Ill., estimates the expense of one of Dr. Hull's curculio catchers at less than eight cents per tree during the curculio season; in view of the ready sale and high prices commanded by stone fruits in all our markets, no one will question the economy of securing the crop to the grower at so trifling a cost; any one doubting the possibility of saving the crop from the curculio by the jarring process is referred to Dr. Hull, Dr. Trimble, Ellwanger & Barry and others who have succeeded in perfecting good crops of these fruits year after year, and each of them could, I think, point out among their neighbors, owners of trees, thrifty and promising as any, who by neglecting to jar down and destroy the curculio, or trusting to some patent wash or worthless nostrum, rarely ever gather enough fruit from their trees to identify the varieties.

Occasionally an individual will urge that it is idle for him to fight this pest while his more indifferent neighbors encourage its increase and dissemination by planting trees and leaving them undisturbed to the ravages of insect enemies. That is not necessarily the case as shown by the gentlemen above named, a single tree may be selected in an orchard, or an orchard in a neighborhood, and by frequent *jarring* and killing the curculios during the proper season the fruit may be exempted from the sting and a good yield harvested, while on the adjoining neglected trees each plum will contain its curculio larva and drop before it is three-fourths grown; but the true plan, and the only way to materially reduce the numbers in a neighborhood or community is by concert of action among all the fruit growers, this course, aided by the parasitic and cannibal enemies, might in a few years make the crop of stone fruit many times more certain than at present. Some high authorities claim that the curculio is the cause of the peach rot, that the fruit is poisoned by the process of puncturing preparatory to laying the egg; whether this is the prime originating cause of the rot is not definitely determined, but it doubtless tends to the spread and increase of this disease. I presume nearly every one has observed the defective and gummy

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appearance of the first peaches of the season that are offered in the markets, nearly every one of them on being opened will show the track of the curculio larva, and frequently the larva itself is found not yet fully developed; the apparent ripening of these specimens being due to the destructive presence of this enemy, and not to the actual perfection of the fruit. In a majority of cases the fruit drops from the tree before the larva has left it to enter the ground, and, by taking advantage of this fact, untold numbers of the pests may be destroyed by having hogs graze in the orchard during the proper season.

The summer of 1870 was, I believe, the third since the Colorado potato-bug (*Doryphora 10-lineata*) was first observed in this part of the State. The first year of their appearance here (1868) they were not sufficiently numerous to excite any alarm or scarcely any attention among potato growers, nor was the crop appreciably lessened by their ravages. During that summer the Agricultural and other journals kept "THE POTATO BUG" so prominently before the people that by the time of their appearance in 1869 the potato growers and many of the consumers were so much alarmed that a total failure of the crop was predicted, and for that reason alone many failed to plant the usual average; in some localities in this county they were very abundant, and in some fields the foliage was fully half stripped from the vines, but to the agreeable disappointment of producers and consumers the crop was not a failure. In some fields where the "bug" was said to be "bad" the yield was nearly up to the average of previous years, and I did not hear any one say he gathered less than half a crop.

Either the weather was unfavorable for their increase and development, or their parasitic and cannibal foes were more numerous and active than we were aware of, for they certainly did not reduce the yield so much in this section as in many others on the second year of their visit; but worse was yet to come and for aught we know worse than that is stored up in the dormant hosts which await their development during the balmy days of next May. It is however difficult to imagine how they could be more destructive than during their third year with us—the past summer of 1870, whole fields of potatoes were completely defoliated and the stalks eaten off down to the surface of the ground. They were flying about in search of food some ten days or two weeks before early potatoes had "come up," and appeared to increase in numbers as the season advanced, some small patches were saved by daily picking off the bugs and sprinkling the vines with Paris Green (Arsenite of copper), which I believe is the best if not the only artificial remedy known except the slow and laborious process of picking.

C. V. Riley of St. Louis, Mo., recommends "watching for the beetles in early spring when the vines are just peeping out of the ground. Ensnare as many of them as you can before they get a chance to pair, by making a few small heaps of potatoes in the field planted; to these the beetles will be attracted for food, and are easily killed in the morning. Keep an eagle eye for the eggs which are first deposited. Cultivate well by frequently stirring the soil, surround your fields on the outside by such tender leafed varieties as the Mercer, Shaker, Russet and Early Goodrich; but, above all, isolate your potato field as much as possible, either by using land surrounded by timber, or by planting in the center of a corn field."

I have copied these suggestions of Mr. Riley's because I think a strict observance of them by whole communities would soon result in the extermination of the pest, but where less than half the potato growers in a neighborhood make any exertion toward subduing the enemy the simplest and most reliable remedy is a judicious use of Paris Green, which may be purchased at any drug store. If used pure it would be as deadly in its effect on the vines as the potato bug, but should be intimately

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mixed with eight or ten times its bulk of ashes or slacked lime, and if applied before the dew is off in the morning, it will become pasty with the moisture and adhere more generally to the leaves.

Recent investigations of the leading economic entomologists of the West lead us to hope that the cannibal and parasitic enemies of the Colorado potato-bug will soon so have increased in numbers as to hold it in check, and render further alarm unnecessary.

West of the Mississippi river, where a few years ago it caused an almost total failure of the crop, it is now held in comparative submission by its natural enemies, and potato culture has again assumed its former rank among the branches of husbandry.

Mr. N. C. Mitchell, of this city, editor of the National Bee Journal, brought me a two-winged fly, the latter part of August last, which he stated had been taken while sucking the juices of a honey bee, which it was seen to capture.

It belongs to a family (*Asilus*) of rapacious flies, all of which prey on other insects mostly captured on the wing. This particular species (*Promachus bastardii*) has not been observed capturing other insects than the honey bee; it usually selects some limb or stump, in a shady retreat, near the hives, and darts on its prey, carrying it back to the perch to suck the juices at leisure. C. V. Riley, of St. Louis, states that a single fly has been known to destroy one hundred and forty-one bees in a day, by actual count of the bee shells found beneath the perch. Mr. Riley suggests capturing with a net, as the only practicable means of reducing their numbers. In some parts of Kentucky and Missouri they have become so numerous as to prevent the bees from swarming. This may be to a great extent remedied by daily watching and dexterous use of the net. Mr. Riley has found in Missouri a somewhat larger, but very similar, fly, equally addicted to destroying the honey bee, which he has named *Asilus Missouriensis;* that too may exist here, and it behooves bee-keepers to be on the watch at the proper season, and mercilessly slay every fly he detects tampering with his bees, without regard to family titles or heritage.

I had intended preparing a list of the birds in Central Indiana, arranging them under the following heads, viz.:

Noxious birds, or such as destroy poultry, grains and fruits.

Useful birds, such as are of direct benefit to the horticulturist and agriculturist from their habits of feeding on insects (or their eggs and crysalids), injurious to fruits and grains, and such birds as divide their attention so nicely between cultivated crops and the insects injurious thereto, that their exact relation to the interests of man has not been definitely settled. But such a report would require more time than I have had at my disposal during the past year.

I think all will agree on the importance of a law for the protection of insectivorous birds. The disciples of Isaac Walton have held meetings, passed resolutions, and propose to petition the Legislature for a law protecting fish; not so much I apprehend with a view to reduce the price by increasing the quantity of fish as an article of diet as to protect game fish from the wholesale slaughter of seining, thereby enhance the sport by increasing the chances of taking them with the hook. I look upon this as a good step, and I am in favor of a stringent fish law and its rigid enforcement.

But if the sport of taking fish with a hook and line is deemed worthy of legislation, how much more important the law that protects the best practical friends of the grain and fruit growers of our State? Game birds, or such as are sought as choice morsels of food during certain months of the year, comprise a very limited number of the great family of insect eaters, while the remaining, and by far the greater number, are totally unfit for the table, and, in most instances, are destroyed in a wanton

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manner, and without the least excuse, by boys, whose ambition should lead them to seek more profitable employment, at least something that would not result in direct injury to so important a class of the community.

In view of the great importance of encouraging the increase of our insectivorous birds, I trust the Indiana State Horticultural Society will, before adjournment, take steps toward securing legislation on the subject.

G. M. LEVETTE.

DISCUSSION.

DR. BROWN.—I made some experiments with the Colorado Bug this year that I neglected to give to the Doctor before he wrote the essay. I planted some potatoes in the spring, not with the expectation of getting potatoes so much as a means of studying the habits of that insect. I planted five rows in my garden—two of the Early Rose, two of the Early Goodrich, and one of the little white Kidney potatoe, which has a very delicate foliage. By the time they began to break the ground I discovered the beetle. I gathered some of them up and destroyed them, as I did not want them to disturb the potatoes till the leaves came out, so that I could watch the process. Soon the leaves began to be covered with the yellow eggs. I examined these with the microscope and watched them until the larva began to unfold from the egg; then I watched its growth and advancement with much interest from day to day. After a while when they were very numerous I discovered on the vines numbers of the lady bug. I at once suspected his mission. I knew the lady bug was not a herbivorous insect; he is a carniverous beetle; he lives and preys upon other insects. I watched his operations, and expected to see him fall upon the larva but he did not go near them. He did not seem to be doing anything. I turned up a stalk and looked on the under side, when I found all the lady bugs at work; they were on the eggs, sucking out the fluid contents. Each bug would go over a hundred eggs perhaps. They would tap whole plantations of them directly. It is proper to state that the potatoe bug like most other destructive insects does its mischief while in the larva state. When the young first comes out it is a true worm, having imperfectly formed legs—no shell; a soft ugly looking worm. It remains in this condition till nearly full size, then goes into the ground, passes from five to fifteen days in the

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crysalis state, and then comes out a perfect beetle. All insects have their destructive stage to vegetation in the larva state.

I tried to coax the chickens to eat them but they would not touch them. I concluded to experiment with the chickens. I had been told that if eaten they would kill the chickens. I knew they were poisonous and was a little suspicious of the effect; but I shut up a half dozen hens, and carefully excluded animal food from them for ten days; they became very hungry for it. I turned them out in my potatoe patch and drove them back when they would try to leave it. They soon commenced on the bugs and in three hours they had cleaned the vines—and strange to say, I looked for them to die, but they did not. That first dose got up the habit and they went on till they destroyed all the beetles. I am now convinced that a few years will so increase the lady bug—the little black and red speckled fellow—that he will suck all the eggs.

I see it stated in the *Canada Entomologist* that the crow acquires the habit of eating these bugs with great greediness, but I can not vouch for the truth of it, but I know that the crow is an omniverous bird.

I do not know of any other bird that will touch them. I thought blue-birds would do it, but on closer observation I found that they would fly down and get other insects but would not touch the beetle.

On the subject of birds I have made no definite report, but I would like before this is printed, if it is agreeable to the society, to supplement it with a report on the birds that are destructive to insects, enemies of fruits and crops.

We have many birds in this country that are great feeders on the larva of insects and the insects themselves. Among these, there is probably none, that of its size, destroys more insects than the blue-bird. Our blue-bird visits us early in the spring, and as soon as they begin it lives exclusively upon insects and their larva. Some birds divide their meals between insects and grains—of this kind is the whole order of Scansores, or climbing birds. Of this the Woodpecker is a good representative. He eats insects but devours grains too. I own too an early prejudice against the "red-head." I was taught that he was the lawful prey in the orchard, and I prided myself upon one of my earliest feats being the construction of a bow and arrow with which I could kill more Woodpeckers than my father could with his shot-gun. I regarded this bird as the sworn enemy of the fruit grower; but I have relented. I think he does

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not take more than he earns. There are several species of this family that are very careful hunters for the insects that hide in the bark of trees.

Without particularizing as to the species of birds, this indiscriminate war upon them that we permit here for sport, for many birds that are insect eaters are destroyed for wanton sport, ought to be stopped.

There is a family of small birds that frequent our fields and orchards in early spring, that if encouraged would destroy more insects than any army of men could destroy. There is no cause besides this destruction of the feathered tribes for the breaking up of the balance between the birds and the insects, for these are mutual counterpoises; they are balances of each other. The check upon the insect-world is the bird-world evidently. We have destroyed our forests and with that destruction we have greatly diminished the number of birds that frequent our fields, gardens and orchards. I know of no way that we can remedy this condition of things without legislation. Bringing here the English Sparrow, as has been talked of, I think will not do much good. If we could increase the number of blue-birds each year by the thousand we would accomplish our purpose, for the blue-bird family are exclusively insectivorous. We may make a substitute. I think the best substitute for the bird is the hog. We may substitute him with a great deal of good effect. I have tried the experiment in an orchard in the country where the Codling Moth and Curculio had almost entirely destroyed the fruit. The hogs were turned in two years ago last summer; we let them eat all the larva they could find in the ground, and they seek them out with a great deal of care. We let them take all the apples that fell, kept them in over last winter and last spring; and this last season, though fruit failed almost everywhere, we had a fine crop of smooth, round, nice apples. We sold several hundred bushels after having all that we wanted for our own use. We lost all the apples that fell to the ground, for the hogs ate them. I think hogs in this way will eventually destroy this moth and the Curculio. I think I can raise plums if I have hogs enough to eat all the fallen plums every year as fast as they fall, if there are no near neighbors that neglect their trees. My hogs were not ringed.

T. MONTGOMERY.—What is your opinion about the bird that punctures the grape?

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DR. BROWN.—It does not destroy grapes enough to pay for the insects it catches. It is a good insect catcher.

J. C. RATLIFF.—One of the Committee on Ornithology, said he had prepared no written report, but wished to remark, in reply to the position taken by Dr. Hull, before this society last winter, that birds generally, are our enemies. I think I can account for the Dr.'s conclusion in this way. In the prairies, where there is an absence of timber, birds are more disposed to eat fruit by the supply of insects being cut off by the scarcity of those which commonly exist in the timber.

I have been devoting some attention to ornithology and entomology, and have collected a few insects that I consider my friends, and some that are enemies, both in the larva and perfect state, and have brought them up for examination.

REPORT OF J. C. RATLIFF ON ORNITHOLOGY.

MR. PRESIDENT:—A report upon either of the subjects referred to this committee may be made to contain a large amount of matter and still the subjects be but barely touched upon. The object of the appointment, judging from the drift of the discussion at our meeting last winter, I presume to be simply an enumeration of what the committee might consider beneficial and what injurious among the different kinds of birds in particular and insects in general.

No fruit grower need be told that his losses in the failure of his crops, can be attributed more to the ravages of insects than from all other causes, that the curculio, the codling moth, the canker worm and the borer are his worst enemies, and more to be dreaded than thieves and pilferers, he knows this from bitter experience. It is a fact equally well established and as generally known, that injurious insects are rapidly multiplying and new ones are annually making their appearance to an alarming extent, so much so that the business of fruit growing, has on this account become uncertain and unprofitable. Therefore, I think it both right and proper that we should even at this late day acquaint ourselves with the characters and habits of insects sufficiently to enable us to distinguish between our friends and foes that we may protect the one and destroy the other. Human agency can accomplish but little in the destruction of insects unassisted by the various means which nature has provided for that purpose. I think we can accomplish more by protecting insectivorous birds and animals than by our most approved method of warfare, including patent traps and dead falls.

From the remarks of Dr. Hull in his lecture before this society last winter we may expect but little assistance from birds, as he regarded any effort to protect them by legislative aid as more injurious than beneficial. I have no means of knowing to what extent birds commit depredations upon the different kinds of fruit in Illinois, let us see how it is in Indiana. I propose to examine them in the order spoken of

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by the Dr. to see how *far* they are injurious and how far beneficial; he "would kill the red-head and most of the sapsucker family," I would not and for the reason that of all the destroyers of the apple tree borer and other wood eating larva, he is pre-eminently the greatest. For other very good reasons I will quote from a standard author on Natural History where he says, "Though this bird occasionally regales himself on fruit, yet his natural and most useful food is insects, particularly those numerous and destructive species that penetrate the bark and body of the tree to deposit their eggs and larva, the latter of which are well known to make immense havoc. In fact insects form at least two-thirds of his subsistence; the masses of bugs, caterpillars, and other larva which I have taken from the stomachs of these birds have often surprised me. It must therefore be allowed that the services of this useful bird much more than compensate for his petty thefts on the apple and cherry trees." It is my belief that many of our young orchards would be destroyed or materially injured each returning season were it not for the services of the red-headed wood pecker.

For what reason the Dr. would kill the sapsucker he does not state, not because he is a fruit eating bird, as this accusation can not be laid to his charge; but probably owing to his practice of girdling our fruit and ornamental trees with small holes picked through the bark. Well, who ever saw or heard of a tree being killed or even injured by being subjected to this treatment? I believe I will venture to advance the theory that instead of being an injury it is a benefit to the tree, that nature employs the sapsucker to perform an important office in the way of correcting its diseased or abnormal condition. I will again quote from the same author. In regard to the sapsucker he says, "Of all the birds of this species none rid the apple trees of so many vermin as this, digging off the moss, and probing every crevice. His industry is unequaled and almost incessant, I consider the sapsucker my friend, consequently do neither kill him nor allow him killed on my premises."

Dr. Hull "can tolerate the robin because he eats up his fruit clean and does not mutilate." I can tolerate the robin because from careful observations it has been demonstrated that every day for three weeks it has collected and carried to its young 40 per cent. of its own weight of the larva of destructive insects. I can tolerate him because he is one of our earliest songsters; even in March while snow yet lingers in shaded places, he gives us a few notes of a song that we all know and all admire. I do not object to dividing a very small portion of the fruit I raise with my friend the robin, in return for his valuable services.

To what extent the oriole "wets his bill in the juice of the grape" in the vineyards of Illinois, I do not know, I have never heard of Indiana orioles being accused of such bad conduct. One thing I do know, both from my own observation and statements of standard authors of natural history, that no bird scrutinizes every leaf, twig, and bough more closely in search of the aphis, the canker worm and the caterpillar than the Baltimore oriole.

In regard to the jay and the cat-bird I believe much can be said in their favor, that when their proof sheet is produced the balance will be placed to their credit. I admit that they are pilferers to some extent, but to counterbalance this, there are the thousands and tens of thousands of insects they destroy before our earliest fruits have matured.

So it is through the whole category of our small birds. Nature has designed them for a wise and benevolent purpose, and endowed them with instincts the tendency of which is to make them the friends and not the enemies of the agriculturist and fruit grower. Would it not be doing great injustice to the blue-bird, the sparrow, the meadow-lark, the tom-tit and the wren to accuse them of being as injurious as benefi-

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cial? Yet I am sorry to say, there are men engaged in the business of horticulture, that are governed by the principle that birds have no rights that they are bound to respect.

The wanton destruction of insect eating birds is to me a satisfactory solution of the question: of the rapid ratio of the increase of different kinds of destructive insects. Nature undisturbed by man, keeps all her operations and proportions in perfect harmony, consequently if insectivorous birds or animals are destroyed or scared away is it any wonder that our crops are made to suffer in consequence of it? Legislative aid may not be necessary in Illinois, but here in Indiana the rigid enforcement of a law protecting small birds would be of almost incalculable benefit to the firuit growers of our State. We have a law it is true upon our statute book protecting quails, pheasants and prairie chickens, from the first of February till the first of October, not because they contribute anything to the interest of horticulture or agriculture, that the strong arm of the law is thrown between them and destruction, but that indolent sportsmen may have the privilege of trespassing on our premises with dogs and guns, shooting among our trees scaring and endangering the safety of our stock, and cases have been known where they have helped themselves to fruit without even saying by your leave. I would like to see this law so modified that the penalty for killing a small bird would be just the same as for killing a quail between the first of February and the first of October. Then by having our appropriation increased from $500, to $1,000, for the purpose of collecting, publishing and disseminating horticultural knowledge, our State would in my humble opinion in the course of a few years take her position as one of the first fruit growing States of the Union.

I. C. FERRIS.—I was a member of this Committee, but I have made no report. I have thought of encouraging the birds by planting many evergreens around my farm. I propose to plant screens on the north and west of my fields, as the evergreens furnish excellent shelter for the birds in winter. I think many of them will stay with us, if we treat them in this way. We should preserve the birds if we want to keep down the enemies of the fruit. I am willing to share my fruit with them; I never miss the peaches or cherries that the birds get. I find that the quails come into my strawberry grounds, but still I have enough to make the pickers very tired before they are done. Quails eat strawberries, and several kinds of birds eat raspberries, but they do not lessen the crops enough for us to miss them. Quails eat grapes to some extent, when the bunches are near the ground; but I am willing to furnish food for the birds. My impression is, that there are few kinds of birds which are not of more benefit than injury to us. In places where a great many birds congregate every season, we are not very much injured by insects.

We have curculios upon the plums, but by spreading something under the tree, and jarring or shaking down and destroying them, we can save our fruit. We may also save our plums by paving under the tree. The curculio is an insect of sly habits; he is also

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very indolent, and sits on a tree until he has destroyed all the fruit, then goes to another. He avoids the trees under which the ground has been paved. I have seen this demonstrated in ten consecutive years. Mr. Longworth contended that he does this from an instinct for the preservation of his young; as the lavra can not get into the ground in such places. I think he avoids these places because he can not hide himself when the ground is paved; he does not like the annoyance of exposure.

MR. MITCHELL, of Gibson Co.—I think it would be destruction to the country to have the English Sparrow introduced. It is a grain bird; a very destructive one to. I would as soon see the Canada Thistle introduced as this bird. If he can not get food readily, in other ways, he will pull the straw out of stacks and destroy the grain.

J. COTTON.—With reference to the destruction of the curculio, there is a gentleman in Ohio Co., who succeeds in raising the finest plums I ever saw. He protects his plums by throwing a pig pen around each tree and there feeding his pigs. One tree that had no pen around it did not produce any plums, while the others did.

I. G. D. NELSON.—I can not indorse everything that is said here. I have had some experience in this matter of raising plums. I have observed the operations of birds to some little extent, and I can not indorse Mr. Ratliff's statement fully; neither can I approve what has been said in regard to the protection of plum trees. I once planted seven hundred trees, under the impression that with the hogs and chickens, I could protect my trees and raise large lots of plums. I pursued it vigorously for awhile, and it seemed to do very well at first, but the curculio will succeed in reaching the trees in some way. It is very determined in its purpose, and if they can not find plums without disturbance, they will follow you pretty close.

I do not like to see the idea go out here, that we can raise plums without the trouble of jarring the trees; it can not be done; any other plan will fail. I have succeeded in raising large quantities, but never, in any other way, after the first few years. They are a little shy, but will not give up. After the plums are gone, they will seek other fruit, peaches, cherries, apples, etc. Their choice is the plum and apricot,; they do not like the peach very well, but will go to it if they can not find the others. If gentlemen wish to raise plums, they must decide upon one thing, *they must jar the trees.* All other remedies will fail. Now, in regard to this matter of birds.

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As to the Sapsucker, I consider him a very damaging bird to the trees. I presume that in all localities he will kill trees. They seek the finest tree in your grounds, and girdle it with accuracy, going around it again and again, until it will die if not protected. Mr. Ferris must be careful about setting out Scotch Pines; the Sapsuckers are very fond of this tree. Some of my fine pear trees were almost entirely killed by them, and others were injured very much. I have never seen any good grow out of the Sapsucker! It is quite distinct from all others of the Woodpecker family. They are a damaging bird upon your grounds; they will injure the trees about the lawns, so that if they do not kill them, the trees will look sickly. We must not let the idea go out without stating a fact when you know it, and let others observe the same thing. We must not let the Sapsucker prey upon us everywhere. All birds do more or less damage, but I am willing to submit to them. The Oriole is a very busy bird; he is very rapid in his movements, and will do a great deal of work in a short time. He will touch every grape, though he may not extract much juice from it. I think he does not do as much damage as he does good, yet he does *much* injury.

DR. BROWN.—What is your opinion as to the object of the Sapsucker in making holes in the tree?

MR. NELSON.—He is after the sap.

J. C. RATLIFF.—I think the sap is in a diseased condition.

MR. NELSON.—I do not think so.

J. C. RATLIFF.—My observation has been that some trees which have been pecked around in this manner, not very extensively, have taken a more vigorous start than they had done for many years. Trees that have been girdled for several feet, still grow and bear fruit. Forest trees, which are girdled from twenty to forty feet grow thriftily. This shows that the Sapsucker was attacking these trees for their own benefit. I have examined the stomach of Sapsuckers, and I am satisfied that their food consists entirely and exclusively of insects. I have examined the stomachs of Woodpeckers, and in no case, have I found the curculio. I expect to make examinations of the Woodpecker, Sapsucker, and Oriole, as to what kind of food they subsist on.

W. H. RAGAN.—There is a particular bird that does this mischief. I never found an insect in that bird's stomach. The birds

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of the Sapsucker family are mostly our friends, but this one is not. Kill the true Sapsucker, and you will find that his tongue is not more than one-third the length of the tongue of the insectivorous Sapsucker, and the tongue of the latter has a barbed point to enable him to take an insect if he should find one.

The Sapsucker pecks down a little place, cutting out the bark, and scraping out the tender substances under the bark, appropriating it to his use. Cuts another place near, then another, and so on, leaving little bars between these places to keep up the life of the tree, not wishing to destroy it entirely. Now I submit, if he is doing the tree any good. He is bleeding the tree and preventing the congestion that might otherwise come up. He is not quite so bright in his colors as the insectivorous bird, but they are very similar in appearance. The Sapsucker is more tinged, with a brownish red crest, and is seen only at certain times in the fall and spring.

DR. BROWN.—Said that he had watched the Sapsucker at work, in order to find out how he made the holes, and for what purpose. He does his work very quickly, and stops not a moment until he makes another. After making a thousand or so holes, he flies away and does not come back that day. He never perforates trees whose sap does not contain sugar. The sap exudes and catches insects by thousands. The bird comes and eats them, then he makes new holes for to-morrow's feast, etc.

DR. FURNAS.—I wish to hear friend Beeler on the dividing line between the birds which are injurious and those which are not injurious.

F. BEELER said in response that it would be difficult to draw a dividing line between the two classes. He thinks that the birds do us a great deal of good, and is anxious to see some measure adopted to prevent their destruction. We see more of this destruction in the vicinity of cities, perhaps, than anywhere else. As to the Sapsucker, I fully agree with friend Ragan. I know there must often be an error made with regard to the bird that does the mischief. When I find the true *Sapsucker* among my trees I kill him at once.

J. COTTON asked I. D. G. Nelson if he had observed at what time the Curculio flies?

I. D. G. NELSON—I have not, but I know that they leave the trees on the slightest disturbance. Jarring the trees takes too much

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work for it to pay. It must be attended to every day, for the work is done very quickly with them. It must be kept up the whole season. It is the only way by which plums can be saved.

J. A. MENDENHALL.—I indorse the same opinions. Hogs, chickens, or anything else will not succeed. They will not do to depend upon.

J. C. RATLIFF—I took a little radical ground for the purpose of waking up members of this society on this subject. I think it is premature to memorialize the Legislature on behalf of any kind of birds until we know positively that they are injurious.

It seems to me a better plan would be to appoint a committee to investigate and determine what birds really are our enemies, and let them report next year. I am not yet satisfied with regard to the Sapsucker, Woodpecker and many other kind of birds. I expect to examine them further. I think this is the only correct way in which we can get at this thing. I would be willing for a bill to be passed protecting every small bird.

LAYTON HAWKINS.—Just as long as unprincipled, marauding boys are allowed to go through the farms and everywhere else shooting a certain class of birds, they will shoot all kinds—without some law they will shoot all the birds we have.

Report of Committe on Premium Essays on Cider Vinegar:

MR. PRESIDENT: The Committee to whom was referred the Essays on Cider and Cider Vinegar have had the same under consideration, and after a careful examination, have awarded the first premium to No. 2. The second to No. 1.

JOS. C. RATLIFF,
S. BURNETT,
CHARLES LOWDER.

No. 2 was announced to be by W. H. Ragan, Indianapolis, Indiana, and No. 1, by W. H. White, South Windsor, Connecticut.

Adjourned.

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REPORTS OF COMMITTEES, &C.

Committee on Implements on exhibition made the following report:

We, the Committee on Implements would respectfully report that we find on exhibition a Fruit Dryer and Room Heater by J. K. Boswell, which we regard as a valuable auxiliary to the fruit grower.

We also find a model of Ragan's Cider and Wine Press, which we regard as a valuable improvement on a class of machinery which is destined ere long to be largely used by fruit growers.

J. C. PHELPHS,
J. A. LITTLE,
Committee.

PAPER BY DR. MATTHEWS.

To the President and Members of the Indiana State Horticultural Society:

MR. PRESIDENT AND GENTLEMEN—Some years ago a paper was read from my pen before you, and you did me the honor to publish it in your transactions—entitled, "Is the cultivation of Fruit destined to remain a permanently profitable business." In that paper it was assumed, that though up perhaps to that time, and possibly for some years to come, the cultivation of Fruit in the west had been, and might still for the time being continue to be a lucrative business, yet the time seems not far distant when it would become like agricultural pursuits, only remunerative; that the fabulous prices realized and the fortunes made by the pioneers in this new field of industry, would, as surely as fate, incite so many to engage in the business as to reduce the prices of their productions until perhaps they might now and then, under favorable seasons, fall so low as to barely pay for raising and handling. Furthermore, it was assumed in the paper referred to, that when the prices of fruits, by overstocking the city markets, fell so low as to only pay a reasonable remuneration to their producers, that many would abandon the business in disgust, so to speak, and thus within a few years, by decreasing the supply, the demand and prices would be increased, and that in this way no one need fear, that upon the whole, the cultivation of fruit for market would not pay him reasonably well, and that this was all which he should expect, or for which he should labor. It was held in the paper in question, that fruit ought to be produced in such quantities and afforded at such prices as to bring it in the reach of all—that like a free gospel, all should enjoy it, almost without money and without price.

And these views I still entertain; I have seen no reason for changing them. Indeed time has confirmed their correctness in my mind. Several years since a gentleman in our State society, boasted that his Early May Cherry Trees had realized him the year previous forty dollars apiece. Will they ever do so again? I think not. That very declaration of his probably caused a thousand men in the State to set out Cherry orchards the next season. Nevertheless, this last season Cherries in the Chicago market paid their producers fairly—enough really—and at the same time were not so high as to be beyond the reach of the families of the industrious mechanics and laborers of that city. So of Strawberries, of Gooseberries, Raspberries, Blackberries,

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&c., &c.; but Grapes scarcely paid us at all. My own, indeed, though very nice Concords and Ives, scarcely paid expenses. And I will here venture to predict that not many great fortunes will be made henceforth in this country by growing and marketing in our city markets, Grapes. Possibly, the manufacturing of wine might pay handsomely for many long years to come, but for one, I am not quite convinced that it is any part of my duty to aid in flooding our country with an article so liable to abuse, and to be turned aside from its legitimate uses to purposes calculated to engender untold wretchedness, and bring upon innocence the biting curses of intemperance.

Gentlemen, no doubt it will be remembered by some of you that the reading of the paper here referred to created quite a hub-bub among the members of the society, and that the views therein expressed were unmercifully, if not unfairly, criticised. If I mistake not, one of the speakers "threw up" to a gentleman present from this State, that he was glad the author did not belong to Indiana, whereupon my Champaigne "Rural" friend, instead of generously defending me, replied that I had learned my narrow, erroneous notions before leaving the Hoosier State.

Well, after the lapse of several years, I think I am safe in asserting that what was set forth in *that* paper, time has, in some measure, at least, sustained. A large, full crop of fruit produced in the great north-west, like a large, full crop of wheat, is very apt to command only fair living prices, if indeed, it does this. But ten chances to one, if the disappointments in obtaining high prices for their berries, does not drive a large number of culivators from the business, thus within a few years greatly reducing the supply, and elevating the prices. This law or rule holds good in nearly every species of business, including both Agricultural and Horticultural. I am glad that it is so. I am glad, and thank God, that competition in this age of the world is apt to bring some good to the laboring classes. If we must strive with and against each other, let us hope that the evil of our contention may be more than compensated by holding those who would amass great fortunes in check, while it aids those to secure a competence, who desire no more. Let us continue in our noble calling, not doubting that properly and energetically conducted, it will always support us and ours, and add comfort and blessings to the public at large.

WM. MATTHEWS.

MASON, ILL., December 13th, 1870.

REMARKS ON THE PAPER.

W. H. RAGAN.—I think the argument used by the writer will be found to be true in the future, since many will quit the business, and the demand for fruits will continue. Many have left the business of fruit raising, simply by "letting it alone"—hence those who remain in the business will receive sufficient pay for their labors to justify them in keeping at it. It is a business that will continue to fluctuate and I would by no means discourage any one.

J. COTTON.—I do not indorse the literary *status* of that paper.

R. VAILE.—It is well for those who go into this business to be on their guard. The communication may do some good in this way.

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The fruit business will probably pay as well as any business, if properly conducted, but not better than other pursuits.

The following resolution, offered by I. C. Ferris, passed by a unanimous vote.

WHEREAS, This Society, recognizing the valuable services of its Corresponding Secretary, W. H. Ragan, in his labors in collecting and disseminating valuable horticultural information, and for his other valuable time devoted to the interests of our Society; and,

WHEREAS, There is no provision in the Constitution for paying a salary for such services; Therefore,

Resolved, That this Society recognize his valuable services, by presenting him a Waltham Silver Watch, worth twenty-five dollars, with proper inscription; *Provided however*, that there is enough money remaining in the treasury after paying other expenses incurred by the Society.

REPORT OF FRUIT COMMITTEE.

Your Committee on Fruits on the table, report that they find on exhibition some fair specimens.

Mr. John Rodney, of Shanghai, Indiana.—Thirty-six varieties, prominent among which was Ortley, W. W. Pearmain, Rock Pippin, Red S. Pippin. Particular attention called to what he called "Hoosier Vandever," recognized as the Penn Vandever. Fine specimens of N. Spy and Pennock.

Mrs. A. Wallace, of Indianapolis, had specimens of Catawba, Herbemont and the Sevam Table Grape. Pears splendid—Vicar, Glout, Morceau, Beurre, Easter, Napoleon, and a splendid specimen Night Blooming Cereus.

S. W. Pearson, Plainfield, Indiana.—Three varieties Apples. One he called White's Long-Keeper, which from appearance *was* truly *named*. Pears fine.

I. D. G. Nelson, Ft. Wayne, Indiana.—Exhibited twelve or fifteen varieties of Pears and Apples, among the latter, Grimes' Golden, from S. B. Marshall, of Ohio, in our opinion very fine in quality.

I. S. Jessup, of LaPorte, Indiana, had a few nice specimens, noticable among which was Prolific Beauty, new and promising.

Mr. E. J. Howland, of Indianapolis, exhibited many fine specimens. Twelve or fifteen varieties Apples and Pears in good condition.

Mr. Mankedick, Indianapolis, exhibited three bottles of Wine and two varieties of Grapes, quality of all of which your committtee can not speak as they were *fully sampled* before we examined them.

All of which is respectfully submitted.

WM. A. RAGAN,
J. A. MENDENHALL,
TYRA MONTGOMERY.

On motion of W. A. Ragan, a general discussion of Fruits was entered upon.

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I. C. Ferris moved that the meeting take up the subject of pruning. Carried.

I. C. FERRIS.—The subject of pruning is one of some interest, and I hope the members of the society will give us the results of their experience.

There are many ideas in regard to the manner of pruning peach trees. Some advocate the theory that after a peach orchard is planted it should be cut back one-third of their growth for two or three years, in order to make the heads low and compact. This has been advocated for a number of years. I think the idea was first disseminated through the country by Mr. Downing, and it was adopted after a time by many cultivators of the peach. I presume that theory has its advocates, but I object to it myself. I have found the best result from the pruning of peach trees is simply to let them alone until they have borne the first crop, except when planting them. At this time I cut back the side shoots only. I prefer to cut off the branches three or four feet from the ground, forming the head there. I think they will come into bearing sooner by this method than by cutting back. I can demonstrate the practical results of my theory in my own neighborhood by the experience of numbers. I have trees three years old that have not been cut back, and they are full of fruit buds, while others adjoining, which have been cut back, have no fruit buds at all. I have several times had half a bushel of peaches from three-year-old trees. I find that the tree will bear sooner if left with a single stem, than with more. After a tree has borne a full crop it is somewhat exhausted; I then head them back. They should not be allowed to bear two successive crops. It is better to throw the bearing seasons into periods of about every other year. We average a crop, at least, every two years. We have had six general crops in the last ten years. By subjecting the trees to that system, I get the trees in an active, vigorous growth, and at the same time bring them into a bearing condition sooner. I do no summer pruning, except to prevent the rotting of the fruit. I prune usually after the falling of the leaves; during open spells in the winter, or in early spring, before the sap rises in the tree. Pruning a tree in an active condition of growth, rather has a tendency to check its growth. I would only do it when the tree is growing too actively. This forces the tree into a bearing condition, instead of making so much wood. I have found good results from summer pruning, in cases of rot. Hale's early is

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inclined to rot. If about the time of ripening there is a rain fall, or much fog, the fungi takes hold, and if it continue to be rainy weather for two or three days, a large crop of this variety will be carried off by the rot. Last summer a year ago, we had that condition of the weather; as soon as I saw the appearance of rot, I thought I might as well have no trees as no peaches, and I gave them a severe pruning. The result was that the peaches which were just beginning to color up in three days ripened, exceeding my expectations. I saved my crop of fruit in that way. Some of the trees looked pretty ragged, but the result was, that they made a fine healthy growth, but bore no peaches last summer; now they are in a good bearing condition again.

W. A. RAGAN.—It is very important that nurserymen should do the pruning right. If we do not have a tree pruned right when it leaves the nursery, it is hard to get it right afterwards. It has been the practice to cut to three shoots from the ground, but unless these shoots come from below the ground, you will never get a durable tree. It will be defective, and liable to split down, and be subject to diseases of various kinds. In cutting off the tree, if of any size, you induce decay. Any large cut in the peach tree will cause decay, and when the trees come into bearing, you will find the wood decayed and brittle, and it will break off easily. In order to have healthy trees, you must train them up with a good stock. I would form the top four feet from the ground, cutting out any limbs that will make a splitting fork. The top should be round and compact. If you cut in trees when the top is formed in the right manner, you get the tree too thick. I would recommend, if the tree stand in the nursery long enough, to cut off all splitting forks. Whenever the weight of the fruit comes on trees with two or three stems, it opens out the branches, but does not open out the fruit—they all bend down together. If you have the limbs coming out all around, whenever the fruit begins to weigh down, the limbs bend, and open the top to the sun. The same is true with reference to apple trees. I would make the body of the apple tree about four or five feet high. It will make a better tree; it will bear better fruit, and you can gather the fruit more easily than when lower. You can pass under and pick up the fruit easier, and it makes a lastier tree than with branches lower down.

R. VAILE inquired if the apple tree should not be cut back till

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after bearing? Some would not cut back unless the growth is too rapid.

Now, in regard to pruning peaches I am well satisfied with my practice in that respect, as compared with the practices of my neighbors, who have followed the shortening in system. It is from the practical results that I base my system. Others make fine healthy trees, as a general thing, yet this thing of heading back may be carried to excess, producing the *yellows*. I do not believe there is a distinct disease which is contagious, that is called by this name, as the people of New Jersey represent. It is a very weak growth of the tree. It shows that the tree has been diseased from some cause; most generally from the peach grub. Where trees are in a manner destroyed by the operations of the grub, it generally produces that peculiar characteristic growth.

I think what they call *yellows*, in New Jersey, is simply the work of the *grub*. We have found that by thorough cultivation, the peach grub does not damage the trees very materially in our district, because the growth is such that the work of the grub is grown over almost as fast as it is done; hence we have seldom lost any trees where they have been cultivated. In New Jersey, there are districts in which the grubs multiply to such an extent, that young orchards planted in the vicinity of old ones, are destroyed before they come into bearing; and they conclude that they can no longer raise peaches.

In regard to pruning raspberries and grapes. I have abandoned the idea of summer pruning raspberries, and avoid staking, as I find that it is injurious to the plants. I will confine my pruning to cutting back in early spring before the sap begins to rise. The old canes should be removed immediately after bearing. I think they do not impair the vitality of the plant to any great extent; perhaps they do some. I think it is not a good idea to prune raspberries, when in a frozen condition; they may be pruned in the fall or in open weather in winter.

The subject of grape pruning and training is of importance. Our old method about Cincinnati was to train with a single stake. Now we hear theories advocated, that we prune too much; that they should be allowed to run on trees, etc. But what is the result? The grapes do not compare in quality with those which are pruned and trained to stakes. They must be kept within proper bounds, in order to produce the greatest amount of saccharine matter in the fruit. I have compared the grapes taken from vines that had not

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been trained, and from those that had, and there is no comparison in the quality of the grapes. They do not get their proper development in saccharine matter, when allowed to run largely.

J. COTTON.—A nurseryman with whom I met recently, said no branch should be removed after it had attained a size more than an inch in diameter; otherwise the trees would soon be found to be diseased and dying. This gentleman said he carries his paint brush and paint, and as he removes a limb, he gives the wound a touch with the brush. He thinks it answers as good a purpose as wax. He goes over his trees in this way, pruning frequently in June, when the sap is at its greatest flow. As to raspberries, I pruned my canes about the middle of November; removed the old canes and feeble suckers, immediately after bearing, leaving not more than four canes to each hill. I pinched them back in the summer, and cut them back to about two and a half or three feet in height, and tied them carefully to stakes. The next season I harvested forty-one gallons from forty hills; they were as fine berries as I ever saw. The vines were not frozen back in the spring below the point where cut when pruned in the fall.

I. C. FERRIS.—I think it is necessary to cultivate peach trees as well as to prune them.

On motion of I. C. Ferris, the cultivation of orchards was taken up.

J. COTTON.—I have but little experience in such things, but it is one of the most doubly pleasant and interesting studies, besides my Bible, that I have undertaken. I can read about and fuss around a tree as much as anybody else. I have been dunning and quizzing men who know much more than I do, for a few years, and gathering up their ideas. My trees are growing very fast—some think too fast. They are not damaged by the frosts. I cultivate my trees with what we term "whole crops." I think the potato is the best crop we can use in the apple orchard. I raised white beans and potatoes last year. These require frequent hoeing to keep the weeds down. I remove the weeds from the collar of the trees, so that the roots can get air and sunlight. I give free applications of fresh bones on the surface. I wash the trees about every month with soapsuds, rubbing them well, before the foliage starts, until I bring on a healthy glow; after that, during the summer, I make a weaker solution. I plow my trees; the ground is kept pulverized

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and mellow. The trees are growing well, forming wood as fast as they ought to. When the trees become established and fruiting, I shall put my orchard in clover, and pasture it with hogs. In plowing, I subsoiled twenty inches deep, then threw up to the center, and planted on the ridge. I still keep the land ridged up in that way by a dead furrow in the middle; it seems to answer a good purpose. I think I will yet put in tile about twenty feet from the trees. I planted my trees forty feet apart, with peach trees between; they have been planted four years, and are all in bearing.

I. C. FERRIS.—I would never again plant an apple and a peach orchard together. My experience with peach trees is this: it is a positively essential principle in the cultivation of a peach orchard that it should be plowed every year at least once, and twice if possible; I contend that they will pay for plowing twice each year. In Ohio, near Loveland, where I lived a few years previous to coming to this State, they cultivate peaches as a business. In the township adjoining the one in which I lived, there were twenty-five hundred acres devoted to peaches. They made a business of it there just as the farmers do in this valley of raising corn; it was nothing uncommon to find fifty or a hundred acres together, devoted to peaches. They regard cultivation of the trees a positive necessity; they plow the orchards once every year, and always throw the earth toward the tree, forming a mound around the root of the tree; they regarded this as essential to the longevity of the tree. The plowing gives vitality to the tree enough to serve for their heavy crop of fruit and keep in bearing condition for the next year. I do not regard it as essential to cultivate an apple orchard after the trees get six or seven years old, but the peach tree should be cultivated every year. In my neighborhood, I can show the effects of not cultivating, by the past year's frost, which has destroyed all the buds on trees which have not been cultivated, while those which have been cultivated have not more than one bud in nine or ten that are killed. This is the result of observation in the last few days.

I came to this State for the express purpose of raising peaches for the market; I would regard the damage at least $500 to every thousand trees, caused by the neglect of cultivation for a single season. I believe I can come here (Marion Co.) and make a peach orchard a success by energy and perseverance in cultivating the trees, I am sure I can do it in Morgan county. I think it does not

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matter about disturbing the roots around the trees in cultivation. Some good results from the mounding. Peach trees require good drainage.

You are perhaps aware that mounding was regarded so highly by one peach grower in Ohio that he mounded his trees to the branches, and even got a patent on his system of mounding. But mounding was done to a certain extent before the patent. He could not patent the idea and prevent me from cultivating my trees just as I chose. Old growers in New Jersey practiced the system of mounding their trees as much as will result from plowing and throwing the earth towards the tree. The good results of this system are due to the drainage it affords. In my locality the natural drainage is very thorough. Where the soils are of such a character as your level table lands in the central part of the State, plowing and throwing to the trees, and the mounding system, are of immense importance to the peach.

R. VAILE.—Gentlemen speak of bringing orchards into bearing in four or five years, I wish to know how I can get my orchard to bear. I planted about a dozen trees in my door yard in 1861, but I have obtained very little fruit from them yet. The next spring I set out some more with the same results. When first planted they were in a blue-grass sod but for the last two years I have cultivated them with the plow, and broken some of the roots. They are still making a good amount of wood but bear but little fruit.

W. H. RAGAN.—I suggest that he plant a few standard pear trees and he will get fruit early. I have pear trees that were planted in '64 that are in good bearing while apple trees planted at the same time have borne very little. Many of my pear trees have yielded three pecks of a season. A. R. Whitney of Illinois practices the method of planting his apple trees very closely, then mutilates each alternate tree in three directions so as to bring those thus treated into early bearing; and by the time they are done the others are large enough to bear well.

The following resolutions were then offered and passed.

WHEREAS, This Society is in its comparative infancy and financially feeble, yet earnest in their efforts to enhance in every laudable way the interests they have in hand and in order thereto they need to travel and correspond extensively for the collection of Horticultural information and such travel and correspondence necessarily involves considerable expense which this Society is illy prepared to incur; therefore,

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Resolved, That the incoming Legislature of Indiana be respectfully memorialized to make an annual appropriation in aid of this Society for the purposes indicated in the foregoing preamble.

J. COTTON,
SETH W. PEARSON.

To the Hon. Legislature of the State of Indiana:

Your petitioners being the association known as the Indiana State Horticultural Society respectfully pray a recognition and representation in the Purdue Agricultural College.

A. FURNAS, President.

W. H. RAGAN, Cor. Sec.
INDIANAPOLIS, IND., Jan. 4, 1871.

To the Hon. Legislature of the State of Indiana:

Your petitioners being the Association known as the Indiana State Horticultural Society would respectfully pray your Honorable body to make an appropriation of ne thousand dollars annually in aid of the important interest your petitioners represent. And your petitioners will ever pray.

A. FURNAS, President.

W. H. RAGAN, Cor. Sec.
SETH W. PEARSON, Rec. Sec.
INDIANAPOLIS, IND., Jan. 4, 1871.

AFTERNOON SESSION.

ADDRESS BY P. BARRY, OF ROCHESTER, NEW YORK.

ORNAMENTAL GARDENING—THE LAWN.

I have not come here so much with a view to instruct or enlighten you, as to show my good will for your society, and the work it is engaged in—the advancement of the science and art of Pomology and Horticulture throughout your State.

I know the value of such societies. I have long been connected with a similar one in our State, and have watched, with much interest, their workings in other States, and can testify to the beneficial results of their labors.

Fruit Culture and Horticulture are, in a great measure, *experimental*. It is so in our oldest States, and in the most highly cultivated portions of the world, and still more so in our new States, where both soil and climate, and their joint effects upon vegetation in general, and upon orchard and garden products in particular, have to be carefully studied before success can be obtained. This bringing together, at certain periods of the year, the most observing and enterprising cultivators of a State, to compare the result of their experiments and labors—to discuss the causes of their failures and successes—is an effectual method of promoting general improvement.

In Europe, especially in England, France, and Belgium, where Horticulture has

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attained the highest degree of perfection in general, societies similar to yours are being rapidly organized. Formerly, Horticultural Societies in those countries confined themselves to competitive exhibitions; now, they have meetings for essays, lectures, and discussions. I congratulate you, therefore, on the existence of this society, and on the high degree of usefulness to which it has already attained. I hope the cultivators of your State will stand by it, and I hope the men of wealth and taste in your cities, as well as in the country, will lend it their aid with a liberal hand.

Its influences are all for good, the improvement of the orchard and the garden is something in which every homestead in the State has a daily interest.

In casting around for a subject on which to offer you a few remarks on this occasion, I found it rather difficult to decide.

Fruit Culture has occupied a large share of attention at all such meetings as this. It is proper that it should, for it is a very important branch of rural industry, and with all the light that has been shed upon it within a few years, there is much yet to be learned and to be told, and I have no doubt but there are many topics connected with it on which I might address you with more or less profit.

The Kitchen Garden, or the Culture of Garden Vegetables, is a most important branch of Horticulture, to which our societies give very little attention. How few families there are, who have gardens, enjoy an ample daily supply around the year of well grown garden vegetables. And how largely such a supply contributes to health, comfort, and happiness, none can tell, save those who have had the experience. Even on the tables of our first-class hotels, the supply of good vegetables, aside from the potato, is scanty and poor.

I mentioned this matter recently to one of the leading members of our society, with a view to have it taken up at its next meeting; but he replied that it was a dull subject, and would, he feared, excite but little attention. Just as I write these lines, I find a leading editorial in the *Gardener's Chronicle*, the first gardening journal in England, and I may say in Europe, expressing the same view:

"There is," says the writer, "a tendency in the modern school of gardening, to look down on the cultivation of vegetables, as a matter quite beneath their notice."

"Any amount of attention is paid, it may be, to bedding plants and grapes, but vegetables, although in such universal request, are shunned and neglected."

Our friend and most efficient co-laborer, Dr. Warder, President of the Ohio State Horticultural Society, in an address delivered last month at Urbana, referring to this subject says:

"How is it within doors, in the dwellings of some of our most extensive and money-making farmers? We may often see good furniture, to be sure; but go to the hospitable board of your worthy host, and though the table be groaning under its load of substantial provisions, you will rarely find that variety of excellent healthful vegetables, with which, as Horticulturists, you are accustomed to regale yourselves and your friends."

Then he quotes from an article in the *Prairie Farmer*, on the same subject, as follows:

"There are whole townships in Illinois (which is, by nature, the Garden of America), where none of the finer sorts of vegetables were ever grown; where the fruit of the egg plant would be as great a curiosity as the palm tree; where a stock of celery was never seen, and where asparagus is only used to decorate the looking-glasses, after the stalks have ripened their seed."

This will apply to parts of other States as well as to Illinois.

We were told that in California the great grain and stock farmers of that State, with

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their thousands of acres of the most fertile soil and perpetual climate, do not grow even a potato for their own tables, but buy everything. We are not quite so bad in the Atlantic States, but there is a general neglect of the culture of garden vegetables and this and similar societies have much to do in this direction.

On this occasion, however, I shall pass by both Fruit and Vegetable Culture, and discuss, briefly, a department which is, perhaps, more neglected in our country than either, to wit:

ORNAMENTAL GARDENING.

In dealing with this subject, it is not my purpose now to enter upon the discussion of principles or plans, or to any considerable extent, trees or plants, but to show how every one who has a garden—every one who resides in the country—may cheaply and easily beautify his grounds, whether large or small, and thus augment the comforts and enjoyments of home.

The most important elements or materials of Ornamental or Landscape Gardening are *Trees and Grass*. With these, and I might say with these *alone*, the hand of taste can create the most charming of rural scenes.

My remarks on the present occasion shall be confined more particularly to *grass*, what in gardening phrase we call the *lawn*—a space of ground of greater or less extent, adjoining the dwellings, kept short and smooth by constant cutting and rolling.

I have selected the special topic, because I regard it as having a most important bearing on the progress and improvement of Ornamental Gardening in this country; It is, indeed, the first step, the foundation.

Need I speak of the beauty of a well kept lawn?

You who have seen good examples will agree with me, that no other production of gardening art gives more real pleasure.

Young and old, rich and poor, learned and unlearned, cultivated or not, all will stop to admire, and utter exclamations of delight at the sight of a beautiful lawn; and it is one of those objects so agreeable to the eye, that it may be said we never get weary looking at it.

Beautiful trees, plants, flowers, and fruits, elicit our admiration, and may even excite surprise and wonder by their magnificence and grandeur; but these sensations are transient compared with those awakened by the sight of a smooth, soft, velvet-like lawn in its fresh, bright verdure.

Travelers, we know, often dwell in raptures on the beauty of English lawns, whilst they pass, almost unnoticed, the other beauties of the landscape.

During my travels in California last summer, this was brought to my mind with peculiar force. We visited gardens filled with rare and beautiful trees and gorgeous flowers, that called forth our admiration; we saw natural scenery where sublimity awed us. Trees of the forest, of such gigantic proportions, that we stood before them in mute amazement; but we met with occasional pieces of lawn that brought from us all the exclamation, "How beautiful!" and we would revert to them afterwards, saying, "How beautiful." Nothing in the way of the beautiful in nature that I met in California, so impressed my mind as the few pieces of the greenest and smoothest of lawns that we met with in the neighborhood of San Francisco.

It is true that in a country like California, where rain does not fall for six months, and all herbage is dried and withered, a green spot is more remarkable and doubtless more keenly appreciated than in a climate like ours. Yet a fine lawn is everywhere and under all circumstances pleasing, refreshing and delightful to the eye, and that even to the eye of uncultivated taste.

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Bacon said three hundred years ago that "there is nothing more pleasant to the eye, than green grass smoothly shorn."

Downing, the most eloquent and appreciative of American writers on such subjects, says: "With a lawn and trees one has indeed the most enduring sources of beauty in a country residence. Perpetual neatness, freshness and verdure in the one; ever expanding beauty, variety and grandeur in the other. What more does a reasonable man desire of the beautiful around him in the country? Must we add flowers, exotic plants, fruits? Perhaps so, but they are all in an ornamental light, secondary to trees and grass, where these can be had in perfection."

"Without this feature, the lawn," the same writer adds, "no place, however great its architectural beauties, its charms of scenery, or its collections of flowers and shrubs, can be said to deserve consideration in point of landscape gardening; and with it the humble cottage grounds will possess a charm, which is, among pleasure grounds, what a refined and graceful manner is in society—a universal passport to admiration." We all know and feel the force and truth of this statement of the great author and artist.

In the recently published reports of the Department of Agriculture at Washington, there is an excellent article on Landscape Gardening, in which it is stated very truly that "A fine lawn is the most beautiful of external ornaments. Soft, velvety, elastic turf, smoothly shorn and of fine color, is always pleasing."

I have said that I regarded the lawn as having an important bearing on the progress of ornamental gardening in this country, and for this reason:

I observe that where people succeed in making a piece of lawn around their dwellings, their gardening taste improves rapidly; disagreeable objects become more so in contrast with the smooth grass, and must be removed; some choice trees and shrubs are added, perhaps a vase or basket or bed of flowers. One object of taste suggests another and another, and thus we make real progress.

This first arrested my attention in and around our own city of Rochester. All around our streets I see now in the summer season charming bits of grass, with brilliant beds and vases of flowers where only a year or two ago there were tangled, unsightly mixtures of fruit trees, shade trees, flowers, long grass and weeds.

This change has added immensely to the beauty of our city, the comfort and enjoyment of the homes of our people, and has doubtless increased considerably the money value of their property.

I have been greatly interested in watching this reform. The first decided impetus given it was the introduction of lawn games, such as *Croquet*, which could not be enjoyed except on a smooth lawn.

At the same time came the little hand lawn mowers, showing that a want is no sooner created than some one is ready to supply it. One hundred and fifty of these hand machines were sold in our city, among our own citizens during the Spring of 1870, and yet five years ago or less, excepting perhaps half a dozen places, there was not a square rod of lawn, properly speaking, around our city and not more than two or three mowers of any kind.

The horse and hand lawn mowers have removed one of the greatest obstacles which have heretofore prevented the people from attempting a lawn.

To know how to cut short grass with a scythe was confined to professional gardeners, and indeed few of them could do it well.

It was an art in which proficiency could only be acquired by long practice, and then it was tedious and expensive.

A lawn which formerly employed two men nearly the whole time to cut it and carry off the grass is now cut in half a day once a week by a man and horse.

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Besides when the scythe was employed, lawns were frequently allowed to become like meadows. Now they are always dressed, because the mowing machine will not permit long grass; it will not cut it; it requires promptness and "perpetual neatness," as Downing expresses it.

The mowing of the lawn is therefore no longer a terror, an obstacle, and there is no other difficulty worthy of mention.

In former times, within my recollection, the opinion prevailed that our American climate would not admit of fine lawns, but time and experience has proved this to be an error. We have now as fine lawns as can be found in any part of the world, and they are made and maintained with as little cost.

A very intelligent English horticultural author who visited this country last autumn, was surprised at nothing more than our fine lawns, which he met with in our public and private grounds, although the season had been unusually dry and lawns had suffered severely. In the article to which I have already referred in the Agricultural Report, it is stated that "Formerly the emerald lawns of Europe were considered unequaled, and it was thought that nothing approaching to their beauty could be realized in this country of scorching suns and summer drouths, but it has been demonstrated beyond any doubt that lawns may be produced and maintained here as fine as those to be found in any country."

The cultivation of flowers, as now practised, in beds, on the lawn is much more satisfactory than the old way of scattering them in borders around the garden, and has really given a great impetus to floriculture.

There is no place where a fine tree or shrub or bed of flowers appears to such advantage as on the lawn; the grass to them is like the background to a painting—the frame to a picture, or setting to a diamond.

Let us then do something if we can, to encourage the growth of this charming feature of modern gardening.

I desire to see every one who has a garden, be it ever so small, devote a portion of it to a lawn. It is a cheap luxury, and must not be confined to cities or villages and their suburbs. It must extend into the country, the farming districts where land is plenty and cheap and horse labor abundant. Why should not every farm house, in all our older farming districts, have its broad and beautiful lawn around it? Are farmers and their families and friends who visit them insensible to the beauties of nature, or incapable of enjoying them? No. I see no people who admire with more enthusiasm a fine lawn and beautiful trees and flowers than country people.

But it may be said that farmers' homes are surrounded by green fields, and they do not need lawns. It is true they are surrounded with green fields, but those are not lawns which spread a polish and beauty around the dwelling. I have heard similar arguments used against the use of public parks for our smaller cities. What would they do with parks when a short drive or walk would take them into the open country? just as though a walk along a country road or a look across the fields and fences would take the place of a park with its smooth walks and drives, its lawns, its trees and other objects that not only delight but instruct.

A smooth and closely cut lawn is no less capable of yielding enjoyment in the country to the farmer's family, than in the city or village, and nowhere does it appear to better advantage than when placed in contrast to farm crops, pastures and meadows.

It is not uncommon to see farmers' families attempting to enjoy some lawn game or amusement on rough ground, among tall grass and weeds, as if they intended a burlesque.

If it were an expensive thing, requiring much hand-labor, I should hesitate to

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recommend it to farmers in this country, where labor is scarce and dear and daily becoming not only more difficult to procure, but of higher price and poorer quality, but as nearly the whole work of making and keeping or maintaining a lawn can be performed with horses, and as there is always some spare horse labor on the farm, I have no scruples on that score.

Then let us push this reform into the country. There it is most needed. It is a cheap luxury for country people. Only think of the change that would be wrought on the aspect of our farm districts, if the gardens and door-yards which are now encumbered with a mixture of fruit and shade trees, weeds, grass and rubbish were converted into smooth lawns, embellished with a few well chosen trees and shrubs! What a source of comfort and delight to the farmers and their families, and those who pass by them! and how largely it would add to their money value. Above all it would make home attractive and bind families to their homes. On this point much might be said, and although I mention it last, I do not regard it as least in importance.

Farmers—American farmers, you who are blessed with such facilities, do more to make your homes attractive to your families, and thus you will cultivate and strengthen the love of home, which is one of the charms of life, and without which men and women are little better than wandering Arabs.

Our educational institutions are sadly deficient in this respect—why should not every school and college in the land, where the minds of youth of both sexes are trained, have its lawn tastefully planted with trees, to be at once a source of enjoyment, to cultivate a taste for the beautiful in nature, and awaken an interest in the study of natural history?

There is a woeful degree of false economy practised in these matters. I have seen the grounds of a young ladies' school, laid out for a pleasure ground, converted into a meadow for the sake of a ton of hay.

The public parks which are now being made by all our large cities, will do much to educate the public mind. The nurserymen of the country, with their extensive grounds and ample resources, can do much to influence taste among the people of the surrounding country.

Their grounds may be not merely nurseries of trees but schools of rural taste. I appeal to them to become the leaders in this reform, it is their interest no less than *duty*.

And now let me state briefly a few of the main points in the making and keeping of a lawn.

1. The ground should be dry, that is entirely free from stagnant water. It need not be rich, because a rank growth is not desirable, but it must be *deep* to enable the grass to resist the effects of dry weather which occurs almost every summer. A week of hot, dry weather in midsummer will dry up the grass on a thin soil, whilst, if properly deepened by trenching or plowing, a whole month will fail to destroy its verdure. We have all seen frequent illustrations of this. A depth of eighteen to twenty-four inches will be sufficient, and none too much.

This deepening of the soil not only insures the safety of the grass in dry periods, but will promote the growth of all trees, shrubs and plants that may be used to embellish it. The depth should also be uniform, for if deeper in some places than others, there will not only be inequalties in the surface, but a want of uniformity in the growth of the grass which will mar the beauty of the lawn.

Evenness of surface is of great importance. I do not mean that it should be level, as an undulating surface, especially if a lawn is of considerable extent is most desirable; but whether level or undulating it should be *smooth*, otherwise the cutting,

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either by scythe or machine, will be difficult and imperfect, and besides, smoothness of surface is one of the charms of a lawn.

The operations of draining, deep plowing, removal of stones and preparing a smooth, even surface for the grass are all well understood, and I need only say that any attempt to make a fine lawn without the thorough, careful performance of this preliminary work will prove a failure. A deep soil and finely pulverized, smooth surface, is the indispensable ground work.

What is the best grass for a lawn? is a question frequently asked. In New York, I prefer Red-Top, Agrostis Vulgaris, and four or five bushels—fifty or sixty pounds—to the acre. The smaller quantity will be sufficient if the seed be clean and sound. Some recommend a mixture of White Clover with the Red-Top, say one-fourth, but I find that with us the White Clover comes in soon enough without being sowed. For the climate of Indiana, I think the Blue-Grass will be better.

Mr. Saunders states in an excellent article on Landscape Gardening, in the Agricultural Report for 1869, that the following proportions have been used in the lawns of the Department at Washington with great satisfaction—one bushel Red-Top (Agrostis Vulgaris), two bushels June Grass or Blue-Grass; Poa Prætenses; one quart Timothy; two quarts White Clover to the acre. The Timothy, he says, vegetates quickly and assists the growth of the others. My experience is in favor of sowing only the permanent grasses intended for the lawn. The sowing of oats, any sort of grain or coarse grass, instead of aiding as is sometimes argued, practically chokes and injures the weaker and finer grasses.

What is the best period of the year for making a lawn? My answer is, that all preparatory work should, if possible, be performed in the autumn, so that during winter the ground may settle and disclose any existing defects of surface, so that they may be corrected before the seeding.

In the spring, at the earliest moment the ground will bear working, plow lightly, harrow well, remove all stones, sow the seed, and give it a good rolling, which finishes the work.

In this way you may have a respectable lawn by midsummer.

Small pieces of lawn in city or village grounds, where expense is a minor matter, can be made better by laying down turf from an old pasture or common instead of seed. The annoyance of weeds which is often experienced in newly seeded lawns will thus be avoided. The preparation of the ground for turf should be the same as for seed.

Turf is usually removed in pieces three or four feet in length, one-and-a-half to two inches thick and about a foot wide. These pieces are rolled up like a ribbon and carried in that shape to the place where they are to be laid. The ground being prepared with a smooth surface, the turf is laid down in strips by a line which will indicate any unevenness that may exist; when laid, it must be beaten flat and even, and if possible, finished by rolling.

CARE AND KEEPING OF A LAWN.

The keeping of a lawn consists chiefly in frequent and careful mowing and rolling. Our rule is to mow once a week, for a short time in the spring when the grass grows with great vigor and rapidity, it is scarcely enough, and in dry midsummer less frequently may do; but the adoption of a rule prevents it from being neglected.

The lawn mowing machines will not operate on grass over two or three inches in length, and hence the necessity of promptness. We use one of Swift's mowers with a horse; it has a heavy roller attached, and cuts and rolls the lawn at the same time. We also use a hand-mower to cut among the trees and on the margin of flower beds.

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To prevent the horse's feet from cutting the lawn, we cover them with leather boots; one pair of which last several years. This would not be necessary if a light pony with smooth shoes were used, but we use a large machine and necessarily a heavy horse.

During spring and fall, when the grass is thick and long, it is caught in a box attached to the front part of the machine, and carried off. In dry weather it is allowed to fall on the ground, as it soon withers and disappears, and is rather a benefit than an injury to the lawn.

In well prepared soils dressings of manure or compost will not be needed for a long time. A rank growth of grass is not desirable; it should be close and fine.

When the grass indicates want of nourishment by its feeble growth or its color, a top dressing of good fresh fertile soil or compost should be given in the fall before setting in of winter, and if the grass dies out or gets injured in spots, seed may be sowed over them either in fall or early spring.

It is to be understood that the surface of the grass must at all time be free from stones or anything that will injure or interfere with the mowing machine. There are many little details in the care and management of a lawn that need not be recited. I have perhaps treated this part of the subject with unnecessary minuteness. My object is to show how easy it is to make and keep a lawn. There is no other way in which so much beauty can be created around the dwelling at so little expense, and this is another reason why I desire to bring the matter to the attention of our people.

Labor is expensive with us, as I have already stated and as you all know, and for the mass of our people, both in city and country, we must recommend plans of garden improvement that can be effected and maintained without much skill or expensive labor. A lawn with a few well chosen trees and shrubs judiciously distributed over it is at once the most beautiful and most economical way of adorning the grounds that surround the dwelling.

It is so cheap and so simple as to come within the reach of every owner of a suburban residence and of every farmer in your State.

The planting of the lawn is a branch of the subject which I shall not dwell on. It may be done in a very simple or in a very elaborate manner, as people's means and tastes will admit. I shall not speak now for those who can afford to expend much on planting. They can procure the requisite skill, if they do not possess it themselves; my aim is to show how cheaply it may be done.

In the first place I may remark that a very common error is planting too much. I have seen many a piece of lawn ruined by having trees and shrubs scattered all over it. This destroys the breadth, one of the chief beauties of the lawn, and makes the mowing and care difficult and expensive.

What I would suggest, is an irregular belt or border of trees and shrubs, evergreen and deciduous, around the margin or outside boundary of the lawn. On the interior a few single specimens of trees and shrubs remarkable for the beauty of their flowers, foliage or habit of growth, may be placed at certain points to remove the impression of barenness, if the lawn be of considerable extent.

The belt or border will vary in width according to the extent of the place, from 20 to 50 feet, more or less. If the place be small, and the belt narrow, small trees and shrubs only should be used. If nurseries be distant or the expense an obstacle, go to the nearest woodland and pick up a sufficient number of native trees and shrubs, which will answer every purpose for a time. I will pass by the subject of *walks*, though not an unimportant one. I believe that those who go about the improvement of their grounds will find no difficulty either in locating the necessary walks, nor in constructing them. Walks are expensive both in making and maintaining, and when labor is scarce, there should be none except those indispensable, for it must

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be borne in mind that walks running through a smooth lawn must be kept in a corresponding condition.

I have no fears about the planting. If we can only induce people to make a lawn, the planting will be done, though not perhaps in all cases as the rules of good taste would dictate.

Now, in conclusion, let me say that I have great hopes for the future of Horticulture in our country. When once improvement in this direction has been fairly inaugurated, its onward movement will be rapid. We are not a slow people. We witness already everywhere around us evidence of progress. I do not agree with those who assert that our horticultural progress is in fruit culture, which is prosecuted solely from motives of gain, and that the growth of nurseries do not indicate a growth of horticultural taste.

Think for a moment of the immense quantities of ornamental trees and plants sold from the nurseries from one end of the land to the other. Think of the tons of flower seeds, flower bulbs, &c., disseminated by the seedsmen and florists. The statement of the sales of some of these articles by some of the more extensive dealers would seem fabulous, and yet we have been told that horticultural taste is not growing in our country! What an error!

I think on the contrary that I am justified in saying that a real love for gardening is being developed here more rapidly than in any other country, among the masses It should be so, for we have advantages of many kinds which no other country possesses.

Our resources and facilities are wonderful, and especially if we compare them with a period only as far back as twenty years. Our nursery and seed establishments are numerous, extensive and complete, offering everything that is new, rare, beautiful or excellent, from every part of the world. The facilities for transportation—steamships, railroads, express companies, the mail bag, all ready to aid in the rapid transmission of seeds, plants and trees.

When we commenced our business at Rochester, there were no steamships on the ocean, no railroads of any consequence anywhere in this country, no telegraphs. What a change we have experienced!

We can order plants from Europe and in a fortnight have them growing in our gardens. From the Atlantic to the Pacific is but a pleasant excursion of a few days, and the most delicate plants can be sent from ocean to ocean in as short a time as it formerly took to cross the State of New York by canal. The frontier settler, far form rail roads, can supply all the wants of his garden through the post. With these wonderful facilities in a country so free and prosperous as ours, the growth of horticultural taste must be certain and rapid. We are now in advance of Europe in Fruit Culture, and I think I may safely predict that before our present generation has passed away, we shall take the lead in general Horticulture.

Our soil, climate, facilities of travel and transportation, the energy of our people, free institutions and past progress, all warrant this prediction.

Let us each and all do our part.

DISCUSSION—DO WINE AND WINE MAKING BELONG TO HORTICULTURE.

I. C. FERRIS.—It has been so regarded in Ohio; so that the grape-grower's and winegrower's associations have been combined with the

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Horticultural Society of that State. If vinegar and cider making is a part of Horticulture then wine making must be a part of it. I can not see why horticulturists of Indiana can not regard wine making in connection with the interests of the State. I know there are objections, as to the morality of wine making, but I do not take that extreme view myself. I think pure wine does not affect the intellect. It is hardly to be expected that a man with his intellectual faculties left clear will drink enough wine to intoxicate him. Take a glass of pure wine and it simply throws a gentle stimulus over the system. I find nothing in the Bible to discourage its use. I think it is part and parcel of horticulture, and we are bound to take cognizance of it when it is presented here.

W. A. RAGAN.—If wine-making belongs to horticulture, whisky-making belongs to agriculture. If it follows in consequence that raising corn belongs to agriculture, and the manufacture of that corn into whisky belongs to the same profession, then making drunkards belongs to agriculture. In the same manner, making drunkards may belong to horticulture. The All-wise Giver of all good gives us the grapes, but it is an invention of man to make the alcohol. You find alcohol in no fruit, grains, or anything else given us for food; it is what you find in the decomposition of them when they have passed from their condition, as suitable for food. We horticulturists should stand up for temperance in every respect. The horticulturist ought not to put into his mouth that which injures his relish for fine fruits, which are intended for man's good; he ought not to encourage men to destroy their happiness and that of the community. It is not necessary to tell you that wine-making leads to intemperance; our land is filled with drunkenness; it is filled with dissipation, which starts in the fashionable saloons where men drink imported wines and fine liquors; and will we say that by our influence we are helping to carry forward that practice which makes sixty thousand drunkards yearly? It does *not* belong to horticulture; it does not belong to producing these fruits, which are part of man's diet.

I. C. FERRIS.—I want to know whether the gentleman ever saw a man drunk upon pure wine? I have lived fortunately in a wine-growing district, where pure wine is made not by the gallon but by hundreds and thousands of gallons, yet I never saw a man intoxicated upon it. Do you suppose that there are any fashionable saloons in this city in which you can get pure wine? I doubt

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whether pure wine will intoxicate, in any moderate quantity. You can eat bread or any kind of food until your intellectual faculties become injured by the quantity; but will a man, with his perceptive intellectual faculties clear, eat or drink to that extent? He would be a glutton; gluttony is condemned by the Bible, so is intemperance. Is it an artificial practice to make wine? Is not the process of fermentation a natural process, according to a law of nature? What is pure wine? It is simply sugar, water, and the grape acids combined. This is all that is pure wine; it can be made of nothing else; if any other element be added to it, it becomes impure. The gentleman has made an appeal to our sympathies; he says intemperance is prevailing in this community. Go to the southern part of France, where wine is drank instead of tea and coffee, and a more industrious, hardy people can not be found on the globe. Compare that community with the people of this country. There are one hundred and fifty drunkards in Indiana where there is one in that country. I am as much opposed to intemperance as any man; I wish to know how it can be made to appear that wine is altogether artificial? Did not the Savior make wine out of water, and it was the best? I have no doubt but that the wine made there possessed all the elements of pure wine; if it did not, it was a deception, and not a miracle. Now who will charge the Savior of the world with practicing deception upon the world? Gentlemen, I want no better morality than the morality of the Bible, no higher religion than the religion of the Bible; no other morality will do us any good, because that is the law by which we will be judged at last.

J. COTTON.—I am rather sorry this matter has been mooted here. This thing of wine-making and wine-drinking is fearfully on the increase. I have traveled extensively through our State, and I am convinced that the habit of making, keeping, and using domestic wines in our families is laying the foundation for more dissipation than any other cause.

I. C. FERRIS.—I deny that such wine as I have spoken of can be made of anything except grape juice.

J. COTTON.—The gentleman was speaking about there being no alcohol in the wine for which he is contending. Alcohol, chemically, is composed of three elements—carbon, hydrogen, and oxygen—which are combined in the process of fermentation. The alcohol is formed in the first stage of fermentation, and, if not checked, it soon passes to the aciduous stage, in which the alcohol is destroyed.

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Now this material of which he is speaking, the pure juice of the grape, had passed into that first stage of fermentation, when its change was arrested, and there the alcohol maintains its decided quality. It will make a man drunk, and keep him drunk. The investigations of chemistry have shown that the alcohol found in that wine—which he contends is harmless—is as destructive and poisonous as prussic acid or corrosive sublimate. This thing of having wines made at home, and given to the children, is laying the foundation for more dissipation than any other thing we have in the country. I have set my face firmly against wine in all its forms, unless it is medicinally used or sacramentally employed.

R. VAILE.—The idea that wine is the *pure juice* of the grape is not the popular idea. Wine drinkers do not want it until it has fermented. If there are no changes in the juice of the grape in passing into wine, it must taste just like the grape juice; if fermentation takes place there is something besides the juice of the grape. Whether it belongs to horticulture or not, we may take anything which is a *proper use* of those articles which are included in horticulture, but does it necessarily follow that we must trace these things out into every possible use? It is proper enough to offer a prize for an essay on the making of vinegar, because that is useful and proper, but it does not follow that we should make wine of grapes or whisky of corn. If agriculturists should make corn into whisky as part of their legitimate business, what would we think of them? Let wine-growers make a specialty of their business, if it must be done; let us keep our hands clear of it. One gentleman has stated that in wine-growing countries there is little intoxication. My information, from those who have traveled in those countries, is that there is as much intoxication there as we have here. If the gentleman has been there, and witnessed it, I accept it as his version of the matter.

I. C. FERRIS.—My information is taken from the statistical reports of the two countries. The deaths which occur from drunkenness in France are confined almost entirely to those who live in the cities, where they use adulterated wine, just as in Indianapolis.

R. VAILE.—If the gentleman means the pure juice of the grape, I have nothing to say.

J. T. FRANCIS.—They say that the pure juice of the grape is not the pure juice after it ferments? What is it? What makes it fer-

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ment? It is the sugar that is in the grape. It is sugar that makes alcohol. You can not make a particle of wine out of grapes, raspberries, or currants without adding sugar, and this sugar grows in Louisiana.

W. A. RAGAN.—If wine is one of the articles which help to make drunkards and bring about dissipation in our country, every temperance man ought to bring his influence to bear against it. If it is the object of this society to make wine, and this tends to dissipation, disorder, and confusion, every member that is in favor of good order and peace ought to come down on any society that would drift in this direction. I do not say that it is, but *if* it is.

It is no use to deny but that there is alcohol in wine, call what you please wine, and the chemists will tell you that this alcohol is poison. Your best temperance men everywhere will tell you that wine-drinking is a species of drunkenness, and leads to drunkenness. If it belongs to horticulture—if we make and sell it to somebody to drink, we encourage by our influence the use of alcohol in a shape that will give a man the first kick down the road to ruin.

I. C. FERRIS.—That wine drinking leads to intoxication and the use of other spirits, is a point in which I think my friends are mistaken. I venture to say that if we could put wine into the market at fifty cents a gallon so as to drive other drinks out of the market it would bring about the greatest reform that we can imagine. Give the community pure wine instead of impure stuff and I will guarantee that fifty per cent. of the present amount of intemperance will disappear. I began when a young man to favor temperance and I still hold to it. I take nothing in the form of whisky; but I have seen no bad results from the use of wine. I have never seen a man drunk on it. I think if persons of my age and older would use a glass of old wine instead of tea or coffee we would enjoy better health than we do, especially in the miasmatic districts.

We propose simply that this society shall take cognizance of wine when presented here, and determine whether it is pure or not.

J. COTTON.—You can not make what is denominated wine without bringing that which is produced in the juice of the grape into the form of alcohol. Alcohol is indigestible—it is not assimilated and taken up by the process of digestion but it operates on the nervous system giving it an unnatural stimulus which is always followed by a collapsed state. You create within the nervous system

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a demand for the stimulus and it will grow; as certain as any law of the universe will produce an effect, it will beget an appetite that will increase until the man becomes a drunkard. Then away with all your wines, as a beverage, and I doubt whether it is really essential as a medicine. I would be glad if there was not a drop of alcohol on God's earth and the art of making it was entirely lost.

S. BURNETT.—I have been growing grapes and making wine for several years, but I am a temperance man—a *teetotaler*. I have been manufacturing pure wine from grapes for the express purpose of furnishing churches and druggists with the article. I never sold a barrel of wine to a saloon keeper to be used for any other purpose. I sell it in small quantities to churches and druggists for medical and communion purposes only. The reason why I commenced its manufacture was that we could not procure pure wine for church use. So far I consider its manufacture legitimate. Wine contains sugar when first expressed from the grape; this sugar changes into alcohol by fermentation. Alcohol is a deadly poison and so far as drinking wine as a beverage is concerned I would discard it. I do not take a glass of it once in six months though handling it almost daily. The only reason why I would justify the making of it at all is for the purposes mentioned. I would be glad if there was not a drop of alcohol in the country, and, if I could be satisfied that the making of wine, as I do, encourages intemperance or was incompatible with Christianity I would not engage in it.

Resolution on the subject.

Resolved, That in the opinion of this Society the manufacture of wine does not properly belong to Horticulture.

CORRESPONDING SECRETARY'S REPORT.

To the Indiana Horticultural Society:

MR. PRESIDENT—I have the honor to report that I have made almost an entire failure in the way of correspondence for the past year.

It seems almost impossible to *draw* out those whose duty it should be to furnish this Society with information concerning the Horticultural status of their respective sections of the State.

Some fail to respond, while many that do, *fail* to say anything that could be of value to our Society. Unless we can adopt some system of soliciting information—

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similar perhaps to that adopted by the agricultural department at Washington—we may as well dispense with any further effort to collect matter of value entirely.

If we send out blank forms with questions so arranged that yes, or no, would be a sufficient answer, with a pre-paid and addressed return envelope, then we may expect to hear at least from those addressed. This would add largely to the expense of our not very full treasury.

During the year I have mailed copies of our transactions to several distinguished horticulturists, not members, in this and other States, from almost all of whom I have received highly complimentary answers. They invariably speak highly of our last volume.

This is a source of great gratification, especially to the Secretaries who labored faithfully to bring up the standard of our heretofore not very enviable little annual. I have no reports from any local Societies to offer. During last August I visited, in company with our President, Treasurer, Secretary, and several members, the Vigo County Horticultural Society. Met with them at the residence of C. W. Barbour, Esq., near St. Marys. Found this a live Society, and judging from their manner of disposing of business, should guess they were doing much good. We spent one day in visiting the different fruit farms and nurseries in the vicinity of Terre Haute. Found the fruit crop rather short, except Grapes which were very fine. There is perhaps no place in the State, where the cultivators of this delicious fruit are more successful than Terre Haute. The Concord, Ives and Catawba were all very fine. P. H. Monninger has sixty thousand vines, mainly of these three sorts, and I do not think it possible for his vineyard, taking culture, location, general management and results into consideration, to be excelled anywhere short of California. Forty thousand of his vines are in bearing, and I learn his yield of wine to have been eleven thousand gallons, with two tons of grapes sold.

Joseph Gilbert also has quite a large vineyard, and his crop was very promising. We were especially pleased with Ives; it has done finely wherever we have met it. We found some fine crops of Pears, especially at Mr. Haas', where we saw the Claps Favorite fruiting for the first time. It was larger than the Bartlett, which it resembled somewhat. The trees were very young and small, showing it to be an early bearer. We passed over the new St. Louis Railroad, along the line of which there is certainly some good fruit locations, especially west of Greencastle, in Putnam County. I think the Peach, Pear and Cherry would succeed well among these White Oak Ridges, and have *no doubt* but it would be the right place for the culture of the Blackberry, since it is almost impossible to kill out the wild ones.

I also attended the late meeting of the Illinois Horticultural Society, held at Galesburg, on the 13th, 14th and 15th of December.

ILLINOIS HORTICULTURAL SOCIETY.

The attendance was good during the whole session, which was composed of an intelligent, enterprising, and I might add, enthusiastic class of horticulturists, not equaled in these respects anywhere east of the "Grand Prairies." But notwithstanding their enthusiasm, I must here claim for our "Hoosier State" superior and greater natural advantages in soil, climate and location for fruit growing. I do not wish to assume the character of an egotist, but must say that these conclusions have been forced upon me, both, by observation and by the character of the "wail" that has ascended from this assembly over insect depredations, root-rot, leaf blight, fire blight, cold winters, bleak winds, parching droughts, and from the best fruit regions

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of the State (Egypt), its remotness from good markets, with slow transportation, bad handling, and the extortions of commission men.

While in deserved praise of the energy of such men as composed this assembly, I must claim that with their skill and practical knowledge, they might be profited by coming to a County where "timber belts" for protection, have been planted by "Dame Nature." We, therefore, extend an invitation to come, assuring them of the protection suggested by the late immigration convention.

There have been a great many valuable reports, essays and papers read by able and gifted men, followed by spirited discussions on topics treated by the writers. The report of the ad interim committee on Pears, read by Parker Earle, of South Pass, is of great value, while at the same time it is made up almost entirely of the melancholy fact that there are few pears that succeed in Egypt. Prominent among these few he mentions the Bartlett, Seckel and Lawrence, causes fire and leaf blight. More cheerful reports come from other sections of the State, and especially from Iowa, in regard to Pear culture.

The apple orchardists heap high their invectives and maledictions on the "Little Turk," codling moth, bark louse and the apple tree borer, but judging from the splendid exhibition of Apples on the tables, I should reckon that "eternal vigilance" had been pretty well rewarded. The apple crop throughout this section of Illinois has been good. A great many cultivators, especially in the north part of the State, are experimenting with seed of the Siberian crab, which possesses extreme hardihood of tree, with fair prospects of yet being rewarded with fruit of good size, fair quality, and like the parent, hardy enough to withstand the rigors of their winters. So far the results have been very satisfactory. Mr. D. B. Weir, of Lacon, exhibits quite a number of specimens from a young tree originating with him, which is of the size of the Jersey black, and appears to keep well. It possesses many of the characteristics of the crab family. I shall look with some interest to the other trial of this sort. We find several varieties appearing on the tables, that are little known and less grown in our State. I shall put myself to some trouble to obtain some of them as they are highly recommended by members of this Society. Prominent among these, especially for market, is the Willow Twig and Minkler. The subject of forest tree planting for timber, shelter, etc., might almost be regarded as a mania here.

One very prominent member of the convention asserted and reiterated his opinion "that the people of Illinois, could not by any possible means, overdo the business of tree-planting." These remarks, extravagant as they were, were highly applauded by the audience. While it is not probable, it is possible to convert these beautiful and fertile fields into a wilderness, such as the writer very distinctly remembers to once have "waved" over the whole of central Indiana, the clearing off which has almost consumed the energies of one generation of stalwart men.

But we would not discourage tree planting even in our own State; but select good varieties for planting.

Dr. Spaulding, of Kirkwood, Missouri, read a paper last evening on "The influence of Wine Drinking on the American People," in which he took strong grounds in favor of its use. Said that its moderate use was a safeguard against malarial and bilious troubles; that it was far better than quinine, while it was far more pleasant to "the palate;" that, in our climate, it was "wine or physic." He could not, however, recommend the use of adulterated "foreign stuff" that was sold under the name of wine, while really it was the worst fabrication, gotten up in New York, and sold in the "original" casks, made by New York coopers in exact imitation of the "true

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original." If a "bomb had fallen in the camp," the result would hardly have equalled the excitement the reading of this paper produced.

Wine and anti-wine men wished to address the chair. Finally, after a good deal of effort, Mr. Daggy, of Tuscola, was recognized, as wishing to introduce a resolution, in which he desired to enter his protest against the indorsement by this Society of any cause which would certainly lead to intemperance, "and that while we recognize in the Grape one of our most delicious fruits, we would discourage its planting for wine alone." Much spirited discussion ensued, and was protracted until a late hour, when some of the more moderate members proposed an adjournment, which, meeting with a second, was put to a vote and carried, which closed rather a tumultuous session. Moral—Let temperance societies care for the wine question, while horticulturists are discussing questions pertaining to the science of horticulture.

Upon the whole, the session just closed has been an interesting one, and, we doubt not, that much good will result to the cause of horticultural science. Such societies might almost be regarded as truly benevolent societies. Meeting together annually or oftener, they publish the results almost "without money and without price." During the session, they have so amended their Constitution as to reduce the price of membership from two dollars to one dollar. This puts the annual volume in the reach of all.

I shall leave for home this afternoon, and here let me tender my thanks to the officers of the I. B. & W. R. R. for their liberality toward myself, and in the cause of horticulture.

My Disbursements and Receipts in behalf of the Society for the year have been:

Paid postage on Transactions, Circulars and Letters	$40 00	
" engraving portrait of R. Ragan	15 00	
" printing Circulars, Premium Lists, &c	8 25	
" Stationery	6 20	
		$69 25
Received from members for 1870	$13 00	
" " S. W. Pearson for engraving	15 00	
		$28 00
Balance due Secretary		41 45

All of which is respectfully submitted.

W. H. RAGAN,
Corresponding Secretary.

TREASURER'S REPORT.

Indiana State Horticultural Society, in account with Charles Lowder, Treasurer.

CREDITOR.

By amount on hand at last report	$44 00	
By amount from Seth W. Pearson—1870	106 00	
By amount from W. H. Ragan	13 00	
By amount eighty-nine members—1871	89 00	
By amount fifteen members—1871—per S. W. Pearson	15 00	
Total		$287 00

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DEBTOR.

To amount paid T. A. Bland—1870	$10 84	
To amount paid W. H. Ragan—1870	27 54	
To amount paid Janitor—1870	5 00	
To amount paid Recording Secretary—incidentals	18 35	
To amount paid Corresponding Secretary—engraving	15 00	
To amount paid Recording Secretary—editing Report	35 00	
To amount paid Janitor—1871	17 00	
To amount paid W. H. Ragan—1871	54 45	
To Cash in hands of Treasurer, January 5, 1871	73 82	
Total		$267 00

CHAS. LOWDER, Treasurer.

REPORT OF FINANCE COMMITTEE.

Your Committee on Finance have examined the report and vouchers of the Treasurer and find them correct, with balance on hand of seventy-three dollars and eighty-two cents.

WM. PATRICK,
JNO. T. FRANCIS,
C. OHAVER,
Committee.

REPORT OF FRUIT COMMITTEE—EIGHTH DISTRICT.

To the Indiana State Horticultural Society:

So far as I have been able to learn, the fruit crop in this district has been about a fourth of a crop. On the 16th of April we had snow four inches deep, and on the 17th, it was eight degrees below freezing point, which killed all the cherries, and the greater part of the apples.

The first on the list of small fruits is the Strawberry, which was a very short crop, owing to the dry season.

The Currants and Gooseberrys averaged about a fourth of a crop.

Owing to the dry season, we had a short crop of Raspberries. The Improved Black Cap did best.

The Blackberry crop was a full one. The Lawton does well.

The Grape crop was an average. The Concord stands first. The Clinton, Hartford, Prolific Delaware, Diana, Catawba, and Isabella all did well in some localities.

The Peach crop was good. The trees are healthy and look well, but the fruit was injured by worms. The buds are now dead, the mercury falling to nineteen

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degrees below zero, on the 23d of December, so it is now understood that we will have no peaches next season.

There was about a half crop of Pears. The fruit was large and perfect, with but little scab, and very little blight. The Duchess, Belle Lucrative, White Doyeyenne, Seckel, Bartlett, and Flemish Beauty are the kinds most generally cultivated.

Apples averaged about a fourth crop. The fruit was large and nice, but affected by worms with less scab than common. Some varieties are now clear of scab that have been very scabby for the past year or two. The White Winter Pearmain was very nice, and the trees full. The season, this last fall and the early part of the winter was very warm, which I think has been the cause of all the fruit, Pears and Apples rotting.

JOHN RODKEY,
Eighth District.

REPORT OF FRUIT COMMITTEE—THIRD DISTRICT.

To the Indiana State Horticultural Society:

GENTLEMEN—My report for the Third District of the fruit of the past season will have but a very meager showing. Apples were almost a failure. I am happy to say, however, that a few varieties have fully sustained their reputation as good bearers, giving a fair yield, even the past season, amid the general failure, among which were Maiden's Blush, Rambo, Jersey Black, Smith's Cider and Rawles' Janet, which are more reliable for Southern Indiana than most others. We learn also, the Fulton so highly esteemed in some parts of Illinois, has borne three successive crops the past three years, and fully sustaining its character for the excellency of its flavor, as a fine desert fruit, as well as a good bearer.

Peaches were almost an entire failure, having none for the market. Pears very limited in crop, also suffered very severely by fire-blight in many parts of our district, as did also the Apple and Quince trees in numerous localities. Cherries were a failure; but of the small fruits we had generally a fair yield. Grapes, a full crop and exceedingly fine, ripening unusually well and showing little of mildew or rot, still grape rot showed itself upon a few varieties, which were treated with sulphur with apparent success. We say with apparent, for some of our friends dispute the virtue of sulphur in curing "the odium," but it disappeared under our treatment, be it from the sulphur or not, but we will sulphur next year at any rate, for we have an abounding faith in the remedy. In conclusion, allow me to say, notwithstanding the severe cold weather we experienced in the last few days, the Peach buds have withstood it nobly upon our hill tops, there are but few yet killed, although subjected to an atmosphere nine degrees below zero—a very dangerous proximity to destruction you will say, as ten degrees below generally kills. I fear I can not speak as well for the valleys.

Wishing you all a Happy New Year, and a happy re-union of the friends of Horticulture, remember me as yours,

I. C. FERRIS.

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FINALE—RESOLUTIONS.

Resolved, That the hearty thanks of this Society be tendered to the proprietors of the Board of Trade rooms, for their courteous kindness in tendering us the free use of their room in which to hold our present session.

Resolved, That the thanks of the Society be tendered all Railroad Companies for favors in passing our members at reduced fare.

Resolved, That the thanks of the Society be tendered the proprietors of the Spencer House for the hospitable manner in which they entertained a large number of the members at reduced rates, during the session.

J. COTTON,
WM. A. RAGAN.

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REPORTS

OF

TOWNSHIP

HORTICULTURAL SOCIETIES,

FOR THE YEAR 1870.

DECATUR TOWNSHIP AGRICULTURAL AND HORTICULTURAL SOCIETY.

To the Indiana Horticultural Society:

This Society has been successfully kept up during the past year, with a constant increase of interest.

We held a fair on the 10th of September, the results of which were highly gratifying. The exhibition of fruits, apples and grapes especially, was very fine, notwithstanding the partial failure of the apple crop in this locality. Of Grapes, the Concord, Delaware, and Catawba were best.

Admission was made free, and the attendance was quite large.

The Society has just purchased a library of appropriate books, worth eighty dollars, which promises to be of much value to the members.

The officers for 1871 are as follows:

President—MOSES ALLEN.
Vice President—JESSE J. WHITSON.
Secretary and Treasurer—I. F. MILLS.
Librarian—DR. S. MILLS.

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HONEY CREEK AGRICULTURAL AND HORTICULTURAL SOCIETY.

To the Indiana State Horticultural Society:

This Society still continues in a good condition, holding semi-annual exhibitions each year, with about the usual interest. The autumn exhibition exceeded, perhaps, that of any previous year, being well represented in every department. The show of apples exceeded that of any previous year, being very large and fair. The crop in this vicinity was about one-half a good yield, but grew large, matured early, and are not keeping well.

The show of peaches was good, surpassing any previous one—the crop being bountiful and fair in quality.

Pears were also well represented, larger ones being on exhibition than at any previous time. The crop was good.

The show of Grapes was not as good as the past year, though several varieties were represented, and the specimens good.

Cherries and Strawberries were almost a failure in this section of the country this season; though, withal, we think the horticultural interest is on the increase among us.

The Society is self-sustaining.

LIST OF OFFICERS.

President—S. J. SCHOOLEY.
Vice President—W. J. FLOYD.
Corresponding Secretary—JONATHAN JOHNSON.
Recording Secretary—JOSHUA CARTER.
Treasurer—ELI CARTER.
General Superintendent—JOHN RODKEY.

BOARD OF DIRECTORS.

GEORGE MAUS.
GEORGE FRANCIS.
JOHN CROMWELL.
GEORGE W. UNGER.
JOHN CARTER.
ISAAC HAUK.

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CLAY TOWNSHIP AGRICULTURAL CLUB, HENDRICKS COUNTY, INDIANA.

To the Indiana State Horticultural Society:

The organization of the Clay Township Farmer's Club has been continued the past year.

A successful exhibition was held in October, and was well attended by our good citizens and substantial farmers. An address was delivered by Dr. A. Furnas, who forcibly delineated the farmer's drawbacks, privileges and advantages, as well as many other things of interest to the fruit grower. All appeared to be satisfied with the decisions and experience of the day, and we trust many were induced to look more to the higher things of life, to the comforts of home, and to adopt more industry, guided by intelligent hands.

OFFICERS.

President—ELWOOD STANTON.
Vice President—ISAAC RATLIFF.
Secretary—JOHN KENDALL.
Treasurer—ANNUAL EDWARDS.
Librarian—ADDISON HADLEY.

PLAINFIELD HORTICULTURAL SOCIETY.

To the Indiana Horticultural Society:

We have the past year held fourteeen meetings, ten of which have been held at the houses of members, and generally well attended.

The past season has not been one very remunerating to the fruit grower. The Apple crop was nearly a failure, and what few there was were knotty and wormy; most fruit growers failing to have enough for family use.

Pears were quite plenty; some very nice ones were displayed on our tables. One member reports selling the Bartlett at six dollars per bushel. Some complain of the blight.

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Peaches were almost a failure in our section, but few having enough for family use.

Cherries in some localities were badly stung with the curculio; the Early May suffering with the later varieties.

The Philadelphia Raspberry yielded a fair crop, and gave good satisfaction. Seth W. Pearson exhibited a new monthly variety, which was recommended for further trial.

The Grape crop has been the largest, and more free from rot this year than for many years past. Even the Catawba was nearly free from disease and loaded with fruit, and again gladdened the heart of the cultivator. The Dorr's seedling was the admiration of the members of the Society, and is recommended for further trial. Most other varieties have succeeded well. The price this year has been lower than usual—some selling as low as five cents per pound.

Currants and Gooseberries suffered from drouth. They bloomed full but dropped the fruit before ripening.

The drouth and bugs made it unfavorable for Potatoe raising, and we did not have more than a half crop, except those that were planted very early. The Early Rose yielded well and brought good prices.

The Society held no exhibition on account of the failure of the Strawberry crop.

The following officers have been elected for the ensuing year:

President—AMOS ALDERSON.

Vice-Presidents—LAYTON HAWKINS, JESSIE WHITE, and B. H. WRIGHT.

Corresponding and Recording Secretary—JOHN H. NICHOLSON.

Treasurer—ELIHU COX.

Librarian—LAYTON HAWKINS.

The Committee on Entomology made the following report through Layton Hawkins, Chairman:

THE CODLING MOTH.

The past season has been one of marked interest to the Horticulturist; furnishing another proof, that vigilance is the price of fruit. And goes far to show the necessity of becoming acquainted with the nature and habits of the insect family.

It seems as if the time had come, when those who are willing to sit down contented and trust to faith, without works, should reap disappointment as a reward in this matter. I have been endeavoring the past season, to investigate on a small scale, the habits of the Codling Moth, and though I may say that I have learned but little, yet I find that they may be attracted, to some extent, by a light at night, and I

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would suggest the plan of placing lights directly over vessels containing strong soap suds.

As to their origin in this country, we are told that our ancestors imported them from Europe, and now they seem to have overspread the continent of America.

The miller is about five-eights or three-fourths of an inch broad when their wings are expanded; the fore wings are a lightish brown and somewhat tinged with red or copper color; the hind wings are inclined to yellow. The miller appears in the winged state in the latter part of the sixth month, and may be seen flying in the dusk of the evening, seeking the young fruit whereon to deposit its eggs, which are probably laid in the blossom, as we often find apples clear of any outside blemish until the worms are half-grown, except a small passage from the blossom to the core, but they generally bore through the side of the apple before they are ready to leave it.

The worms when small are white with a black head, but when near maturity they assume more of a flesh color. Many of the worms leave the fruit before it drops from the tree, and readily avail themselves of any convenient hiding place, whether under a scale of bark or a bunch of leaves lodged in the fork of the tree; and although I have not tried Dr. Trimble's hay rope, I think it might be beneficial. Some of them hatch out in a few days, after spinning their cocoons, which perhaps, lay their eggs in our dried fruit in the fall, causing wormy dried fruit.

But many, no doubt, remain housed up until the warm weather returns.

Respectfully,

LAYTON HAWKINS.

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TABLES OF FRUITS, ETC.,

RECOMMENDED BY THE

INDIANA HORTICULTURAL SOCIETY

AT THE

ANNUAL MEETING AT INDIANAPOLIS,

JANUARY, 1871.

EXPLANATIONS.—N., Northern Indiana; C., Central Indiana; S., Southern Indiana. In the season column, S., stands for summer; A., for autumn; W., for winter; E., for early; L., for late. In the N., C., and S. column, three dots (...) denote that the variety is unknown or not fully tested; a dash (—), that it is known, but not approved; a star (*), that it is generally approved; two stars (**), much approved, or popular; a dash and star (—*), that it does well in some localities only. H., for hardy; P., for productive; T., for tender; U., for unproductive.

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Number.	NAME OF FRUIT.	Dist.			Peculiarities of Trees.							
					Hardiness and Productiveness.						Trees.	Shoots.
		North.	Center.	South.	North.		Center.		South.			
	Apples.											
1	American Golden Russet	✲			T	U	T	U	T	U	Vig'rous, upr'gt	Erect, dark
2	American Summer Pearmain	✲	✲	✲	T	U	H	P	H	P	Slow, large	Slender
3	Astrachan Red	✲✲	✲✲	✲✲	H	P	H	P	H	P	Vig'rous, upr'gt	Reddish bro'n
4	Autumn Seek-no-further		✲				H	P			Large, spreadi'g	Slender
5	Autumn Sweet Swaar	✲			H	U					Spreading	Vigorous
6	Bailey's Sweet	✲			H	U					Vigorous	Dark
7	Baldwin	✲✲	✲✲	✲	T	P	H	P	T	P	Robust, spr'd'g.	Dark brown
8	Belleflower, Yellow	✲	✲	✲	H	U	H	U	H	U	Spreading	Yellowish
9	Belmont	✲	✲		H	P	T	P	H	P	Vig'rous, spr'dg	Light olive
10	Benoni		✲	✲✲	H	U	H	P	H	P	Small, upright	Slender, bro'n
11	Ben. Davis	✲✲	✲✲	✲✲	H	P	H	P	H	P	Upright, vig'r's	Reddish bro'n
12	Broadwell	✲	✲		H	P	H	P	H	U	Vig'rous, spr'dg	Light yellow
13	Buckingham		✲	✲			H	P	H	U	Vig'rous, upr'gt	Sl'ndr, r'd,d'k
14	Carolina Red June		✲		H	P	H	P	H	P	Vig'rous, upr'gt	Slender, dark
15	Campfield		✲	✲			H	P	H	P	Spreading	Slender
16	Cooper	✲			H	P					Spreading	Reddish, sl'dr
17	Canada Reinette	✲			H	P					Vig'rous, spr'dg	
18	Clayton		✲				H	P			Vig'rous, upr'gt	Yellowish
19	Duchess of Oldenburg	✲✲			H	P					Medi., r'nd-he'd	Stout, brown
20	Early Harvest		✲✲	✲	H	U	H	P	H	P	Spreading	Pale olive
21	Early Pennock		✲		H	U	H	P	H	P	Upright	Erect, dark
22	Early Jo	✲	✲	✲	H	P	H	U	H	U	Vig'rous, spr'dg	Dark
23	English Golden Russet	✲✲	✲		H	P	H	P	H	P	Vig'rous, spr'dg	Stout, dark
24	Evening Party	✲			H	P					Upright	Reddish gray
25	Fallawater	✲✲	✲✲	✲	H	P	H	P	H	P	Vig'rous, spr'dg	Stout, dark
26	Fall Orange	✲			H	P					Spreading	Red
27	Fall Pippin	✲	✲	✲	H	U	H	U	H	U	Vig'rous, spr'dg	Stout, dark
28	Fall Wine		✲	✲✲	H	P	H	P	H	P	Med., spreading	Slender
29	Fameuse	✲	✲		H	P	H	P	H	U	Vigorous	Red
30	Fulton		✲				H	P	H	P	Large, vigorous	
31	Gilpin		✲	✲	H	P	H	P	H	P	Vig'rous, spr'dg	Stout, dark
32	Golden Sweeting	✲✲	✲✲	✲✲	H	P	H	P	H	P	Vig., ro'nd-he'd	Stout, dark
33	Gravenstein	✲		✲	T	P	T	P	H	P	Vig'rous, spr'dg	Vigorous
34	Hagloe		✲				H	P	H	P	Vig., ro'nd-he'd	Stout, blunt
35	Hoop	✲	✲✲	✲	H	P	H	P	H	P	Vig'rous, upr'gt	Slender
36	High-top Sweeting	✲	✲		H	P	H	P	H	P	Vig'rous, upr'gt	
37	Hubbardston Nonsuch	✲	✲	✲	T	P	T	P	H	P	Vigorous	Dark
38	Indiana Favorite		✲				H	P			Vig'rous, spr'dg	Bark red
39	Jersey Black	✲✲	✲✲	✲✲	H	P	H	P	H	P	Small, spreadi'g	Slender
40	Jarminite		✲				H	P			Vig'rous, spr'dg	Slender
41	Jonathan	✲	✲	✲✲	H	P	H	P	H	P	Slender, droop'g	Li't br. shade
42	Keswick Codling	✲	✲		H	P	H	P	H	P	Vigorous	Dark
43	King of Tompkins County	✲	✲		H	P	H	P	H	P	Vig'rous, sprd'g	Stout, dark
44	Large Yellow Bough	✲	✲	✲	T	U	T	U	H	U	Vig., compact	Light green
45	Ladies Sweeting	✲		✲	H	U			H	P	Thrifty	
46	Late Strawberry	✲			H	P					Upright, thrifty	
47	London Sweet	✲			H	P					Vig., upright	
48	Lowell	✲✲			H	P					Vig., ro'nd-he'd	
49	Maiden's Blush	✲✲	✲✲	✲✲	H	P	H	P	H	P	Vig., spreading	Slender
50	McAfee's Nonsuch	✲	✲		H	P	H	U			Upright, vig'r's	
51	Melon	✲	✲		T	P	H	P			R'd-he'd, spr'dg	
52	Milam		✲	✲	H	P	H	P	H	P	Vig., ro'nd-he'd	Reddish
53	Mother	✲✲			H	P					Slender	Dark green
54	Moore's Sweeting	✲	✲✲	✲✲	H	P	H	P	H	P	Vig., spreading.	Dark olive
55	Newtown Pippin	✲	✲		H	U	H	P	H	P	Large, spreadi'g	Stout, reddish
56	Northern Spy	✲✲	✲		H	P	H	P	H	U	Large, upright	Reddish
57	Peck's Pleasant	✲✲	✲	✲	H	P	H	P	H	U	Healthy, spread	
58	Pennsylvania Vandevere	✲	✲		T	P	H	P			Vig., spreading.	Slender
59	Pickard's Reserve	✲	✲		H	P	H	P			Upright, vig	Light yellow
60	Porter	✲	✲	✲	H	P	H	P	H	P	Vig'r's, healthy.	Slender
61	Pryor's Red			✲	T	P	T	P	H	P	Thrifty, upright	Reddish olive.
62	Primate	✲	✲		H	P	H	P			Stocky, vig'ro's	Stout, short
63	Rambo	✲✲	✲✲	✲✲	T	P	T	P	H	P	Upright, thrifty	Dark
64	Ramsdell Red	✲			H	P					Vig'ro's, uprig't	Slender, red'h
65	Rawles' Janet	✲	✲✲	✲	T	P	H	P	H	P	Thrifty, spr'd'g	Brownish
66	Red Canada	✲✲		✲	H	P			H	P	Slender, thrifty.	Slender
67	Rhode Island Greening	✲	✲		H	P	H	P	H	U	Crook'd, spre'dg	Stout, dark
68	Roman Stem	✲	✲		H	P	H	P			Moderately vig.	Slender
69	Rome Beauty	✲	✲✲	✲✲	H	P	H	P	H	P	Thrifty, r'd-h'd.	Slender, red
70	Red Stripe	✲	✲	✲	H	P	H	P	H	P	Hardy, spread'g	Downy
71	Ragan's Red		✲				H	P			Vigorous	Slender
72	Spitzenburg, Newtown	✲	✲	✲	H	P	H	P	H	P	Vig., spreading.	Brownish
73	Spitzenburg, Esopus	✲		✲	H	P	H	U	H	P	Vig., upright	Slender
74	Summer Rose		✲				H	P	H	P	Vig., spreading.	Stout

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Place of Origin.	Peculiarities of Fruit.						Remarks.	Number.
	Season.	Size.	Shape.	Flavor.	Color.	Quality.		
America ..	E. W....	Med.	Conical	Sub acid..	P. russet..	Best	Table and desert	1
N. Jersey.	L. S.....	Med.	Round ..	Sub acid..	Striped....	Best	Slow grower in nursery.....	2
Russia	S.....	Large ...	Flat.....	Acid	Red, str...	Good	Cooking and market.....	3
Penn.	A	Med.	Flat.....	Sub acid..	Striped....	V. good.	Table and kitchen.....	4
.....	A	Large ...	Flat.....	V. sweet..	Yellow	Good . ..	Baking and market	
New York	L. A. ...	Large ...	Round..	Sweet	Striped ...	Good	Kitchen, table, and stock	6
Mass.....	W.....	Large ...	Flat.....	Sub acid..	Striped ...	Good	Cooking and market	7
N. Jersey.	E. W....	Large ...	Oblong .	Acid	Yellow	Best	Best on poor soil.....	8
Virginia ..	E. W....	Large...	Conical.	Acid	Yellow	Best	Bitter rot in south	9
Mass	E. S.....	Small ...	Round..	Sub acid..	Striped....	Best	Dessert, kitchen, and market.	10
Kentucky	W.....	Large ...	Round..	Sub acid..	Striped....	R. poor.	Fine appear.; val. for market	11
Ohio	W.....	Large ...	Round..	Sweet	Yel., bl'sh	Best	Table and kitchen.....	12
Virginia "	A.	Large ...	Conical	Sub acid..	Striped....	Best	Fall Queen of some.....	13
N. Carol'a	E. S.....	Small ...	Oblong .	Sub acid..	Red	Good	Scabs badly.....	14
N. Jersey.	L. W....	Med.	Flat.....	Sweet	Blushed...	Poor	Good for cider.....	15
America ..	A.	Large ..	Flat.....	Sub acid..	Striped....	Best.....	Table, kitchen, and market ...	16
Europe....	W.....	Large ...	Flat.....	Acid	Yellow	V. good.	Table and cooking.....	17
Indiana...	L. W....	Large ...	Conical	Acid	Striped	Good	Kitchen and market.....	18
Russia	S.....	Large..	Flat	Acid	Striped	Good	Cooking and market.....	19
New York	S.....	Med.	Flat.....	Acid	Yellow	Best	Table, kitchen, and market....	20
America ..	S.....	Large ...	Round ..	Acid	Striped....	Poor	Market and kitchen.....	21
New York	S.....	Small ...	Conical	Sub acid ..	Mix'd,red	Best.....	Dessert only	22
England ..	W.....	Med.	Round ..	Sub acid..	Russet	V. good	Table and kitchen.....	23
Penn	W...	Med.	Flat	Acid	Striped....	Best	Dessert	24
Penn	E. W....	V. large	Conical	Sweet	Green	Poor	Fine for market.....	25
Mass	A.	Large ..	Round..	Acid	Blushed ..	Good	.....	26
America...	A.	V. large	Round ..	Acid	Yellow	Best.....	Dessert, kitchen, m'k't, dry'g	27
America...	A.	Med.	Flat.....	Sub acid..	Red, str....	Best	Scabs badly.....	28
Canada....	A.	Med.	Round ..	Sub acid..	Red, str ..	V. good	Dessert, kitchen, and market.	29
Illinois ..	E. W....	Large ...	Flat.....	Acid	Yel., bl'sh	Good	Scabs badly.....	30
Virginia..	L. W....	Small ...	Round ..	Sweet	Striped....	Good	Cider and stock	31
Conn	S.....	Large ...	Round ..	Sweet	Yellow	Good	Baking and market	32
Germany..	S.....	Large ...	Flat.....	Sub acid..	Striped....	V. good	Table and kitchen.....	33
N. Jersey.	S.....	Large..	Round ..	Acid	Striped....	Good	Kitchen and market	34
Penn	L. W....	Med.	Flat.....	Acid	Striped....	Good	Market	35
Mass	S.....	Med.	Round ..	Sweet	Green	Good	Table and kitchen.....	36
Mass	E. W....	Large ...	Round ..	Acid	Striped....	V. good	Table and cooking.....	37
Indiana ...	W.....	Med.	Flat.....	Sub acid..	Red, str...	Good	Table and market	38
N. Jersey.	E. W....	Med.	Round ..	Sub acid..	Dark, red	Good	Table, kitchen, and market ...	39
Ohio.	L. W....	Med.	Round ..	Sub acid..	Striped ...	Good	Table and market	40
New York	W.....	Med.	Oblong .	Sub acid..	Red, str...	Best	Dessert and cooking.....	41
England ..	A.	Med.	Oblong .	Acid	Yellow	Good	Cooking.....	42
New York	W.....	Large ...	Round..	Acid	Striped....	V. good	Table, kitchen, and market ...	43
America ..	S.....	Large ...	Conical	Sweet	Yellow	Good	Market and stock	44
New York	W.....	Large...	Round..	Sweet	Striped ...	V. good	Table and baking.....	45
New York	A	Med.	Conical	Sub acid..	Striped....	Best.....	Dessert especially	46
Ohio	W.....	Large ...	Flat.....	Sweet	Yellow	Good	Very best for baking	47
America ..	A.	Large ...	Round..	Sub acid..	Yellow	V. good	Table, cook'g, drying, market	48
N. Jersey.	A.	Large ...	Flat,....	Acid	Blushed...	V. good	Cooking and drying.....	49
Ky	W.....	Large ...	Glob'lar	Acid	Striped....	Good	Market	50
New York	A.	Large ...	Flat.....	Sub acid..	Striped....	V. good	Table and market	51
South	W.....	Small ...	Conical	Sub acid..	Red, str..	Good	Dessert	52
Mass.....	E. W....	Med.	Oblong..	Sub acid..	Red, str...	V. good	Dessert	53
....	W.....	Large ...	Flat.....	Sweet	Red	Good	Baking and cider.....	54
New York	L. W....	Med.	Round ..	Acid	Yellow	Best.....	Dessert	55
New York	W.....	Large ...	Conical	Acid	Striped ...	Good	Coarse; market.....	56
R. Island.	E. W....	Large ...	Round ..	Sub acid..	Yellow ...	V. good	Table, kitchen, and market....	57
Penn	W.....	Med.	Flat.....	Acid	Striped....	Good	Kitchen; subject to bitter rot	58
Indiana ...	W.....	Large ...	Flat.....	Acid.....	Yellow	V. good	Table and kitchen.....	59
Mass.....	A	Large ...	Oblong .	Acid.....	Yellow	V. good	Kitchen, table, and market....	60
Virginia ..	W.....	Large ...	Round .	Sud acid..	Red, str...	V. good	Affected by change of soil	61
New York	S.....	Med.	Round ..	Acid	Yellow	Best	Dessert	62
Penn	A.	Med.	Flat	Sub acid ..	Striped....	V. good	Table, kitchen, and market....	63
Conn	A.	Large ...	Oblong .	Sweet	Striped....	Good	Early bearer; baking, stock...	64
Virginia ..	L. W ...	Med.	Conical	Sub acid ..	Striped....	V. good.	Dessert, kitchen, m'ket, cider.	65
Mass.....	W.....	Med.	Conical.	Acid	Striped....	Best	Table and kitchen	66
R. Island.	E. W....	Large ...	Flat.....	Acid	Green	V. good	Cooking and dessert.....	67
N. Jersey.	W.....	Med.	Round..	Sub acid..	Yellow	Good	Table and cooking.....	68
Ohio	W.....	Large ...	Flat.....	Sub acid..	Striped ...	Good	Market	69
Indiana...	S.....	Med.	Conical	Acid	Striped....	Good	Table, kitchen, and market.....	70
Indiana...	A.	Large ...	Round..	Acid.....	Red	V. good	Table and market.....	71
L. Island.	E. W....	Large ...	Flat.....	Sub acid..	Striped....	Best.....	Sc'by and defect. on old trees..	72
New York	E. W....	Med.	Conical	Acid	Red	Best.....	Rots on tree in some localities	73
N. Jersey.	E. S.....	Small ...	Round..	Sub acid..	Striped	V. good.	Family, table, and kitchen.....	74

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Number.	NAME OF FRUIT.	Dist.			PECULIARITIES OF TREE.							
					Hardiness and Productiveness.						Tree.	Shoots.
		North.	Center.	South.	North.		Center.		South.			
	Apples.											
75	Smith's Cider	✲	✲✲	✲✲	H	P	H	P	H	P	Vig., str. limbs.	Light olive
76	Summer Queen	✲	✲	✲	H	P	H	P	H	P	Vig., spreading.	Slender
77	Swaar	✲	✲	—	H	P	H	P	H	P	Vig., spreading.	Stout, dark
78	Tallman's Sweet	✲	✲	✲	H	P	H	P	H	P	Vig., spreading.	Yellowish
79	Trenton Early	✲✲	✲✲	✲	H	P	H	P	H	P	Vig., spreading.	
80	Twenty Ounce	...	✲	—	.....	.....	H	U	H	P	Thrifty, r'd-he'd	Reddish bro'n
81	Victuals and Drink	✲	✲	—	H	U	H	U	H	U	Vig., spreading.	Slender
82	Wagoner	✲✲	✲✲	✲	H	P	H	P	H	P	Thrifty, upright	Stout
83	Westfield's Seek-no-further	✲	✲	—	H	P	H	P	H	U	Thrifty, spread.	
84	White Pippin	✲	✲✲	✲✲	H	P	H	P	H	P	Vig'rous, upri't	Very dark
85	Winesap	✲	✲	✲	H	P	H	P	H	P	Vig., stragl'g.	Dark
86	Willow Twig	—	✲	✲	H	P	H	P	H	P	Vig., spreading.	Olive brown
87	William's Favorite	✲	—	✲	H	P	H	P	H	P	Slow, spreading	
	Pears.											
1	Bartlett	✲✲	✲✲	✲✲	H	P	H	P	H	P	Upright, spread	Yellowish
2	Belle Lucrative	✲✲	✲✲	✲✲	H	P	H	P	H	P	Mod'rate, upri't	Yello'ish gray
3	Beurre d'Anjou	✲	✲	✲	H	P	H	P	H	P	Pyramidal	Light green
4	Beurre Diel	✲✲	✲	✲✲	H	P	H	P	H	P	Large, irregular	Dark, grayish
5	Beurre Gifford	✲	✲	✲	H	U	H	P	H	P	Straggling	Slender, red'h
6	Blood Good	✲	✲	✲	H	P	H	P	H	P	Mod'rate grow'r	Reddish bro'n
7	Doyenne d'Ete	✲	✲	✲	H	P	H	P	H	P	Vig'rous, upri't	Brownish red
8	Doyenne White	✲	✲	—	H	P	H	P	H	P	Vig'rous, upri't.	Yello'ish gray
9	Early Catharine	✲	✲	—	H	P	H	P	H	P	Hardy	Slender
10	Flemish Beauty	✲✲	✲✲	✲✲	H	P	H	P	H	P	Vig., spreading.	Dark brown
11	Glout Morceau	✲	✲	—	H	U	H	P	H	P	Vig., pyramidal	D'k oliv'-gre
12	Howell	—	✲	...	H	P	H	P	.....	....	Strong	Brown
13	Julienne	—	—	✲✲	H	P	H	P	H	P	Thrifty, upri't.	Yellowish
14	Madeleine	—	—	✲	H	P	H	P	H	P	Vigorous	Greenish
15	Onondaga	—	✲	✲✲	H	P	H	P	H	P	Vigorous	Yellow
16	Rostiezer	✲	✲✲	...	H	P	H	P	.....	.....	Spreading	Olive colored
17	Seckel	✲✲	✲✲	✲✲	H	P	H	P	H	P	Small, ro'd-head	Short, stout
18	Sheldon	✲	✲	✲	H	P	H	P	H	P	Vigorous, erect	Yellowish
19	Doyenne Gray	✲	✲	✲✲	H	P	H	P	H	P	Vig., upright	Grayish bro'n
20	Doyenne Boussock	–✲	✲	✲	H	P	H	P	H	P	Vigorous	Diverging
21	Beurre Bosc	–✲	✲	✲✲	H	P	H	U	H	P	Vigorous	Bro'nish olive
22	Buffum	—	✲	—	H	P	H	P	H	P	Erect, vigorous.	Reddish
23	Tyson	✲✲	✲	✲✲	H	P	H	P	H	P	Upright, vig.	Dark brown
24	Lawrence	✲	✲	✲	H	P	H	P	H	P	Mod'rate gro'th	
25	Vicar of Winkfield	✲	✲✲	✲✲	H	P	H	P	H	P	Straggling	Strong
26	Winter Nelis	–✲	✲	—	H	P	H	P	H	P	Thrifty, stragl'g	Diverging
	On Dwarf Stock.											
1	Louise Bonne de Jersey	✲✲	✲✲	✲✲	H	P	H	P	H	P	Vig., upright	Strong
2	Duchess d'Angoulemme	✲	–✲	–✲	H	P	H	P	H	P	Upright, strong	Yello'ish br'n
3	Belle Lucrative	✲	✲	✲✲	H	P	H	P	H	P	Mod'rate, upri't	Yello'ish gray

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Place of Origin.	Peculiarities of Fruit.						Remarks.	Number.
	Season.	Size.	Shape.	Flavor.	Color.	Quality.		
Penn	W.....	Large ...	Round ..	Sub acid ..	Striped....	Good	Cooking and market.....	75
New York	S.....	Med.....	Conical.	Acid	Striped....	V. good.	Kitchen and market.....	76
New York	W.....	Large ...	Round ..	Sub acid ..	Yellow.....	V. good.	Table and kitchen.....	77
R. Island	W.....	Med	Round ..	Sweet	Yellow.....	Good	Use baking and stock.....	78
.....	L. S.....	Large ...	Conical.	Acid	Pale yel...	Good	Dessert and kitchen.....	79
Conn.....	A	Large ...	Conical.	Acid	Striped....	Good	Market, cooking and drying...	80
N. Jersey.	A.....	Large ...	Conical.	Sweet	Gree'h yl..	Best.....	Table, baking and stock.....	81
New York	W.....	Large ..	Flat.....	Sub acid ..	Striped....	Good	Market, table and kitchen.....	82
Conn.....	W.....	Med	Conical.	Sub acid ..	Striped....	Good	Table and market.....	83
.....	L. W....	Large ...	Round ..	Acid	Pale yel...	V. good.	Kitchen, table and market.....	84
N. Jersey.	L. W....	Med	Conical.	Acid	R. Striped	Good	Market, kitchen and cider.....	85
Virginia ..	L. W....	Large ...	Round ..	Acid	Seriped....	Good	Market and culinary uses.....	86
Mass	S.....	Med	Round ..	Sub acid ..	Striped....	Good	.....	87
England ..	Ag., St..	Large ...	Obtuse .	Sub acid ..	Yellow.....	V. good.	Table, kitchen and market.....	1
Belgium...	Ag., St..	Med	Conical.	Sweet	Green	Best.....	Table and kitchen.....	2
France.....	St., Oct	Large ...	Obtuse .	Vinous.....	Yellow	Best.....	Table and market.....	3
France	St., Oct	Large ...	Pyrif'm	Sweet	Yellow	V. good.	In cold soils, coarse.....	4
Europe.....	Jul., Ag	Med	Turb'te	Vinous.....	Blushed...	V. good.	Regular bearer.....	5
New York	Aug.....	Med	Turb'te	Aromatic.	Yellow	Best.....	Regular bearer.....	6
Europe.....	July	Small ...	Obova'e	Sweet	Ye low	V. good.	Dessert; early bearer.....	7
Europe.....	St., Oct	Med	Obova'e	Sweet	Yellow	Best.....	Cracks in some localities.....	8
.....	Aug.....	Small ...	Pyrif'm	Sweet	Yellow	Good	Slow in bearing	9
Europe.....	Ag., St..	Large ...	Obova'e	Sweet	Yellow	Good	Table and market; bears early	10
Europe.....	De , Ja.	Large ...	Obtuse ..	Sweet	Yellow	V. good.	Family.....	11
Conn.....	Sept.....	Large ...	Obova'e	Sub acid ..	Yellow	Good	Table and market.....	12
.....	August.	Small ...	Obova'e	Sweet	Yellow	Good	Dessert and kitchen.....	13
.....	July	Med	Pyrif'm	Sweet	Green	V. good.	Dessert	14
Conn.....	St., Oct	Large ...	Pyrif'm	Sub acid ..	Yellow. ...	V. good.	Table, kitchen and market.....	15
Europe....	Ag., St..	Small ...	Pyrif'm	Sweet	Gr. blush	Good	Dessert	16
Penn	Ag., St..	Small ...	Obova'e	Rich	Yel. blush	Best.....	Dessert	17
New York	St., Oct	Med	Conical.	Vinous.....	Yellow	Good	Kitchen and market.....	18
France.....	Oct.....	Med	Obova'e	Delicious..	Russet	V. good.	Family and market.....	19
Europe	St., Oct	Med	Obova'e	Sweet	Yellow	Best.....	Family and dessert.....	20
Belgium ..	St., Oct	Large ...	Pyrif'm	Sweet	Russet	Best.....	Dessert and market	21
R. Island.	Sept.....	Med	Obova'e	Sweet	Russet	V. good.	Regular bearer.....	22
Penn	Ag., St..	Med	Pyra'dl	Sub acid ..	Ye low	Good	Tardy bearer.....	23
L. Island.	Nv., Ja.	Med	Obtuse ..	Sub acid ..	Yellow	V. good.	The best early winter.....	24
France.....	Nv., Ja.	Large ...	Lg. Py'l	Sub acid ..	Pale ye l...	Good	Good for baking and market...	25
Belgium ..	Jan	Med	Roun'h.	Sweet	Green	V. good.	Dessert and market.....	26
France.....	St., Oct.	Large ...	Pyrif'm	Sub acid ..	Gr. blush..	Good	Very productive; market	1
France.....	Oct.....	Large ...	Oblong..	Rich	Yellow	V. good.	Dessert and market	2
Belgium...	Ag., St..	Med	Conical.	Sweet	Green	Best.....	Table and market.....	3

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Number.	NAMES OF FRUIT.	Dist. N	Dist. C	Dist. S	PECULIARITIES OF TREE. H	P	Tree.	Shoots.	Leaves.	Place of Origin.
	PEACHES.									
1	Columbia	...	...	☼	T	....	Slow grower	Dark purple	Reniform	Georgia
2	Crawford's Early	☼	☼	☼	T	U	Vigorous	Yellowish	Globose	N. Jersey.
3	Crawford's Late	☼	☼☼	☼	T	U	Vigorous	Reddish yellow.	Globose	N. Jersey.
4	Druid Hill	...	☼	—	H	P	Very vigorous	Large	Globose	Maryland
5	George the Fourth	☼	☼	☼	H	U	Vigorous	Diverging.	Globose	New York
6	Grosse Mignonne	☼	☼	☼	....	....	....	....	Globose	France
7	Hale's Early	☼	☼☼	☼	H	P	Vigorous	Large	Globose	Ohio
8	Heath Cling	☼☼	☼☼	☼☼	H	P	Vigorous sp'd'g.	Stout	Reniform	Maryland
9	La Grande Heath Free	☼	☼	☼☼	H	P	Vigorous	....	Reniform	N. Engl'd
10	La Grange	...	☼	☼	H	P	....	....	Reniform	N. Jersey.
11	Morris' White	☼	☼	☼☼	H	P	Vigorous	....	Reniform	Penn'a
12	Morris' Red Rareripe	...	☼	—	H	P	Vigorous	Stout	Globose	Penn'a
13	Oldmixon Freestone	☼	☼☼	☼☼	H	P	Vigorous	Stout	Globose	America
14	Oldmixon Cling	☼☼	☼☼	☼☼	H	P	Vigorous	Upwright	Globose	Europe
15	October Yellow	...	☼☼	☼	H	P	Flower large	....	Reniform	France
16	Smock Free	☼	☼☼	☼☼	H	P	....	....	Reniform	N. Jersey.
17	Stump the World	☼	☼	☼☼	H	P	Spreading	Stout	Globose	....
18	Troth's Early Red	☼	☼	☼☼	H	P	Flower small	....	Globose	America
19	President	☼	☼	☼☼	H	P	Vigorous	Upwright	Globose	L. Island
20	Fleenor	...	☼	☼☼	H	P	Vigorous upr't.	Slender	....	Indiana
	CHERRIES.									
1	Early May	☼☼	☼☼	☼☼	H	P	Spreading	Slender	....	Belgium
2	Early Purple Guigne	This class cherries not st'd by Soc'ty.			H	U	Spreading	Pendant	....	....
3	Elton				T	P	Vigorous, upr't.	Stout	Large	England
4	Yellow Spanish				T	U	Short, thrifty	Stout	Large	Europe
5	Governor Wood				T	P	Round head	Vigorous	D.r.f sk	Ohio
6	Napoleon				T	U	Erect, vigorous	Upwright	....	Holland
7	Gridley				....	P	....	....	....	Mass
8	Knight's Early Black				H	U	Moderate gro'er	Short	....	England
9	Elkhorn				T	P	Vigorous	Gray	Broad	England
10	Black				T	P	Vigorous	Dark	Large	Italy
	QUINCE.									
1	Orange				T	P	Vigorous	....	Oval	....
	GRAPES.									
1	Concord	Not starred.			H	P	Vigorous	....	Downy	Mass
2	Ives Seedling				H	P	Vigorous	....	....	Ohio
3	Hartford Prolific				H	P	Vigorous	....	Downy	Conn
4	Delaware				H	P	Not yielding	....	Mildews	Ohio
5	Clinton				H	P	Vigorous	....	Smooth	New York
	CURRANTS.									
1	Cherry	Not starred.			H	P	Strong, erect	Stocky	Large	Italy
2	Red Dutch				H	P	Thrifty	Upwright	....	....
3	La Versaillaise				H	P	Thrifty	Upwright	....	France
4	White Dutch				H	P	Vigorous	Erect	....	....
5	White Grape				H	P	Vigorous, sp'ng	Strong	Medium	....
6	Knight's Sweet Red				H	P	Thrifty	Erect	....	....
	GOOSEBERRIES.									
1	Houghton Seedling				H	P	Very spreading	Slender	Green	Mass
2	Mountain Seedling				H	P	Large, spread'g.	Long	Green	Penn
3	Downing's Seedling				H	P	Stocky	Upwright	....	New York
	RASPBERRIES.									
1	Doolittle's Blackcap	Not starred.			H	P	Strong	Curved, thorny	....	New York
2	Philadelphia				H	P	Strong	Erect	Thick	Penn'a
3	Clarke				....	....	Strong	....	....	....
4	Davidson's Thornless				....	....	Spreading	Slender	....	....
5	Canada Blackcap				H	P	Spreading	Curved	....	....
	BLACKBERRIES.									
1	Kittatinny	Not starred.			H	P	Thrifty	....	Ovate	N. Jersey.
2	New Rochelle or Lawton				T	P	Strong, vigor'us	Stout	....	New York
3	Wilson's Early				H	P	Strong	Erect	....	N. Jersey.
4	Dorchester				H	U	Vigorous	Erect	Br'dov'l	Mass
	STRAWBERRIES.									
1	Wilson's Albany	☼☼	☼☼	☼☼	H	P	Moderate	....	....	New York
2	Green Prolific	☼	☼	☼	H	P	Vigorous	....	L'g th'k	N. Jersey
3	Charles' Downing	...	...	...	....	....	....	....	....	....
4	British Queen	...	...	...	....	....	....	....	....	....
5	Napoleon III.	...	...	...	....	....	....	....	....	....
6	Jucunda	☼	☼	☼	....	....	Not vigorous	....	....	....
7	Seth Boyden	...	...	...	....	....	....	....	....	....

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PECULIARITIES OF FRUIT.							REMARKS.	Number.
Class.	Season.	Size.	Shape.	Flavor.	Color.	Quality.		
Free	Sept.	Large	Ro'nd'h	S. acid	Brown	Best	Bright yellow flesh	1
Free	August.	V. large	Ro'nd'h	Rich	Bl'sh yel.	V. good	Flesh yellow, melting, rich	2
Free	L. Sept.	Large	Ro'nd'h	Vinous	Bl'sh yel.	V. good	Flesh yellow, market	3
Free	Sept.	V. large	Ro'nd'h	Rich	Red	V. good	Flesh greenish white	4
Free	L. Aug.	Large	Round	Rich	Red	Best	Stone small, flesh pale	5
Free	August.	Large	Ro'nd'h	Vinous	Red	V. good	Flesh yellowish white, st'n s	6
Free	July	Medium	Round	S. acid	Red	Good	Flesh white, rots on the tree	7
Cling	Octob'r.	V. large	Oblong	Rich	White	Best	Flesh white, keeps late	8
Free	Sept.	V. large	Oblong	S. acid	White	Good	Flesh white, red at stone	9
Free	L. Sept.	Large	Oblong	Sweet	White	Best	Flesh pale, fine for canning	10
Free	Sept.	Large	Oval	Sweet	White	Best	Flesh white to the stone	11
Free	August.	Large	Ro'nd'h	Sweet	Bl'sh'd	V. good	Flesh white, red at stone	12
Free	Sept.	Large	Ro'nd'h	Sweet	Yel. red	Best	Flesh white, quite red at sto'n	13
Cling	Sept.	Large	R'd'ho'l	Rich	Yel. bl'd	Best	Flesh white, best canning	14
Cling	Octob'r.	Medium	R'd'ho'l	Sweet	Yellow	Good	Yellow flesh, for pre-erving	15
Free	L. Sept.	Large	Oval	Rich	Yellow	Good	Flesh yellow, market	16
Free	Sept.	Large	Oblong	S. acid	Wh'e bl'd	V. good	Flesh white, market	17
Free	August.	Medium	Round	S. acid	Red	V. good	Early market	18
Free	Sept.	Large	Round	Rich	Red ch'k.	Best	White, deep red at stone	19
Cling	Octob'r.	Large	Oblong	Rich	White	Best	Market and canning	20
STALK.							RECOMMENDATION.	
Long	May	Medium	Round	Acid.	Red	Good	Market	1
Long	May	Medium	Heart	Sweet	Dark red.	Best	Family use	2
Long, sl'r	June	Large	Heart	Sweet	Yel. bl'd.	Best	Family use	3
Stout, l'g.	June	Large	Obtuse	Sweet	Yel. bl'd.	Best	Family use	4
Long	June	Large	Heart	Sweet	Yel. bl'd.	Best	Family use	5
Stout	June	Large	Heart	Sweet	Yel. bl'd.	Best	Family use	6
	July	Large	Heart	Sweet	Black	Good	Trial	7
Stout	June	Large	Heart	Sweet	Black	V. good	Trial	8
Short	July	Large	Heart	Sweet	Black	Good	Trial	9
Long, s't.	July	Large	Heart	Sweet	Black	Good	Trial	10
	Sep. Oct	Large	Ro'nd'h		Golden	Best	Market and family	1
BUNCH.							REMARKS.	
Compact	Sept.	Large	Globu'r.	Sweet	Black	Good	Market and family	1
Compact.	Sept.	Medium	Round	Sweet	Black	Good	Market, family and wine	2
Shouldr'd	Sept.	Large	Globu'r.	Sweet	Black	Good	Early market	3
Small	Sept.	Small	Round	Sweet	Light red	Best	Dessert and family	4
Medium	Sep. Oct	Small	Round	Acid	Black	Good	Keeps late	5
Short	Early	V. large	Round	Acid	Deep red.	Good	Market and family use	1
Long	Medium	Medium	Round	Acid	Dark red.	V. good	Kitchen and market	2
Long	Late	Large	Round	Acid	Dark red.	Good	Market and family	3
Short	Early	Medium	Round	S. acid	Yel. whi'e	V. good	Table and market	4
Long	Medium	Large	Round	S. acid	Yel. whi'e	Best	Dessert, market and kitchen	5
	Medium	Medium	Round	S. acid	Red	Good	Recommended for trial	6
	Early	Small	Oval	Sweet	Brown	Good	Market and kitchen	1
	Late	Large	Oblong	Sweet	Red	V. good	Table and market	2
	Late	Medium	Round	Sweet	Red	Best	Recommended for trial	3
PROPAGT'S								
Tips	Early	Large	Oval	Sweet	Black	Best	Dessert, kitchen and market.	1
Sucker	Late	Large	Round	Sweet	Red	Good	Dessert and market	2
Sucker					Red		Recommended for trial	3
Tips					Black	Good	Recommended for trial	4
Tips	Late	Large	Oval	Sweet	Black	V. good	Recommended for trial	5
Sucker	Early	Large	Conical.	Sweet	Black	V. good	Table and kitchen	1
Sucker	Late	Large	Round	S. acid	Black	V. good	Table, kitchen and market	2
Sucker	V. Early	V. large	Oval	Sweet	Black	V. good	Dessert and market	3
Sucker	Early	Large	Oval	Sweet	Black	V. good	Recommended for family use	4
CLASS.								
Stam'na'e	Medium	Large	Conical.	Acid	Crimsson	Good	Table, market and kitchen	1
Stam'na'e	Medium	Large	Round	Acid	Scarlet	Good	Market and family	2
							Recommended for trial	3
							Recommended for trial	4
							Recommended for trial	5
Stam'na'e	Medium	Large	Conical.	S. acid	Scarlet	Good	Recommended for furt'r tri'l	6
							Recommended for trial	7

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PLAINFIELD HORTICULTURAL SOCIETY'S FRUIT LIST.

Explanation.—First column—Class—A. for acid; S. A. for sub acid. Second column—Color—R. for red; Str. for striped. Third column—Season—A. for autumn; W. for winter; E. for early, and L. for late. Hardiness of tree, productiveness, and quality of fruit are designated as first, second and third quality, first being best.

Name.	Class.	Color.	Season.	Size.	Hardiness of tree.	Productiveness.	Quality.	Remarks.
American Golden Russet	S. acid.	P. russ	E. W.	Small	3	2	1	[bearing.
American Sum. Pearmain	Acid.	Striped	L. S.	Med	1	2	1	Slow grower; long in
Astrachan Red	Acid.	Red	E. S.	Med	1	2	2	
Autumn Seek-no-further	S. acid.	Striped	A.	Med	1	2	1	Slow grower. [rot.
Baldwin	Acid.	Red	W.	Large	2	1	1	Inclines to dry or bitter
Bellflower, yellow	Acid.	Yellow	W.	Large	1	3	1	Productive on white clay.
Carolina Red June	Acid.	Red	E. S.	Small	1	1	2	Scabs badly.
Daniel Apple	S. acid.	Striped	E. S.	Small	1	1	2	
Early Harvest	Acid.	Yellow	E. S.	Med	1	1	1	
Early Pennock	Acid.	Striped	S.	Large	1	1	2	Rots on the tree.
Fallawater	S. acid.	Blush	E. W.	Large	1	1	2	Nearly sweet.
Fall Pippin	Acid.	Yellow	A.	Large	1	3	1	
Fall Wine	S. acid.	R. str.	A.	Med	1	1	1	Scabs in some localities.
Gilpin	S. acid.	R. str.	L. W.	Small	1	2	3	Nearly sweet.
Hagloe	Acid.	Striped	S.	Large	1	1	2	Good for market.
Hoop	Acid.	Striped	L. W.	Med	1	1	2	
Horse Apple	Acid.	Y. B.	L. S.	Large	1	1	2	Good to dry.
Indiana Favorite	S. acid.	R. str.	W.	Med.	1	2	2	
Jersey Black	S. acid.	R. red.	E. W.	Med	2	1	2	
Jarminite	S. acid.	Striped	L. W.	Med.	1	1	2	
Sweet Bough	Sweet.	P. yel.	S.	Large	2	3	1	
Maiden's Blush	Acid.	Blush	A.	Large	2	1	2	Good market; bears early.
Melon	S. acid.	Striped	E. W.	Med	1	1	2	
Milam	S. acid.	R. str.	W.	Small	1	1	2	Subject to bitter rot.
Moore's Sweeting	Sweet	R. str.	L. W.	Med	1	2	2	
Michael Henry Pippin	Sweet	Green	W.	Med	1	1	2	Early bearer.
G. N. Pippin	Acid.	Green	L. W.	Med	1	2	1	Scabs badly.
Northern Spy	Acid.	Striped	W.	Large	1	1	2	Late in bearing.
Pennsylvania Vandevere	Acid.	Striped	W.	Med	1	1	2	
Pickard	Acid.	Yellow	W.	Large	1	1	1	Not fully tested here.
Pryor's Red	S. acid.	R. str.	W.	Med	2	3	1	
Rambo	S. acid.	Striped	L. F.	Med	1	1	1	
Rawles' Janet	S. acid.	Striped	L. W.	Med	1	1	1	
Rhode Island Greening	Acid.	Green	W.	Large	2	2	1	
Roman Stem	S. acid.	Yellow	W.	Small	1	2	1	
Red Stripe	Acid.	Striped	E. S.	Large	1	1	2	
Newtown Spitzenburg	S. acid.	Striped	E. W.	Med.	1	2	2	
Summer Rose	Acid.	Striped	S.	Small	1	2	1	
Smith's Cider	S. acid.	Striped	W.	Large	2	1	3	Good for market, etc.
Summer Queen	Acid.	Striped	S.	Med	2	2	2	
Tallman's Sweeting	Sweet	Yellow	W.	Med	1	1	2	
Trenton Early	Acid.	Yellow	S.	Large	2	1	2	
Victuals and Drink	Sweet	Green	A.	Large	2	2	1	
Westfield Seek-no-further	S. acid.	Striped	W.	Med	1	2	1	
White Pippin	Acid.	White	W.	Large	1	1	1	
Winesap	Acid.	Red	L. W.	Med	1	1	2	
Vandevere Pippin	Acid.	Striped	W.	Large	1	1	2	
White Winter Pearmain	S. acid.	Yellow	W.	Med	1	1	1	Scabs badly.
Yellow June	Acid.	Yellow	E. S.	Small	1	2	2	Desirable for earliness.
Pennock	S. acid.	Red	W.	Large	1	1	3	Specks badly.
Limber Twig	Acid.	Red	W.	Med	1	3	3	
American Pippin	Acid.	Striped	L. W.	Med	1	2	3	
Kirkbridge White	Acid.	Yellow	S.	Med	1	1	1	Tree poor grower.
Belmont	S. acid.	Yellow	W.	Med	1	2	1	Not fully tested.
Clayton	S. acid.	R. str.	W.	Med	1	1	2	
Ortley	Acid.	Yellow	W.	Med	1	2	2	Scabs badly; worthless.

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APPENDIX.

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ESSAY ON LAWNS AND ORNAMENTAL GROUNDS.

BY I. C. FERRIS.

GENTLEMEN:—It is with distrust in my own ability to please you, and at the same time present an essay upon the above subject, simple, comprehensive and practical, or useful, without following in the wake of others who have written on this subject. Indeed it would be almost impossible to say anything original that would be applicable to the subject, so much has already been said and written for our instruction, and now if I should but condense and adopt as my own a few of the thoughts others have before me expressed, you will pardon me for being a copyist, or adopting as my own what may have been expressed by others. It seems to me that any essay upon this subject should be accompanied by a plate or drawing explanatory of the author's views, as simply illustrating his subject in order that his essay may be practically useful to the public, hence I send you the accompanying pencil sketch, which might be adapted to one acre or five acres of ground, in square or parallelogram form. I have endeavored to make it plain and simple, square or parallelograms being the most common form of grounds around our buildings, devoted to the useful and ornamental purposes of houses, out-buildings, barn-yards, kitchen gardens, orchards and pleasure grounds. I have endeavored to present you a sketch that may be equally adapted to a suburban residence or the farm, and if I can succeed in illustrating, so as to give a useful, practical lesson that will benefit our society and the public upon this most intricate subject, I shall have gained my purpose. But therein rises the distrust in my ability.

The pencil sketch I present before you, pre-supposes say five acres of ground, in square or nearly so, situated on a street or public road leading from and in the immediate neighborhood of town or city, and occupied as a suburban residence, with carriage drive leading from the street through the grounds, with a well kept lawn upon either side, and at intervals well grown specimens of evergreens along the drive, as represented by the plat, and immediately in front

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of the dwelling is an oval lawn, with a few choice specimens of evergreens, with a group of Norways to the right, that will assist in hiding from the front view the kitchen, garden and out-houses, which should be in rear of the dwelling and immediately in front of the stable and grounds around it, as well as the kitchen garden, is an evergreen screen to hide these more unsightly objects from the public view. This screen may be made of arborvitæ or hemlock, as taste may dictate. Interspersed over the lawn may be planted a few specimen trees, both of evergreens and the more ornamental of the deciduous, such as cut-leaved weeping birch, Kilmarnock weeping willow, Fountain willow, Salisbury Adriantifolia, Magnolia, Conspicua, etc., etc. For the lawn, the ground should be made smooth and level, occasionally rolled with a roller, and frequently and closely mowed with a sharp lawn scythe or hand mower. Blue grass being best adapted, if thus treated, will form a beautiful green and velvety carpet the season through, forming a most pleasurable sight and an indispensible groundwork to the beauty and harmony of the landscape view. Then the arboreteum, bordering in front and on both sides of the place, and almost surrounding the lawn, forms but the frame to the picture. It may be a gilt frame, with high mouldings upon the outer edge, or it may be of more humble pretensions, but, at all events, the taller trees and shrubs should be planted on the outer border. These may be of our native forest trees, and interspersed or not with evergreens, accordingly as the taste of the proprietor or projector may run, never in stiff and angular lines, but in the natural order, blending and grouping in harmony with nature, and gradually bringing down the height until the inner border may be but beautiful flowering shrubs, interspersed with the more dwarf evergreens, such as Irish juniper, tree boxes, mountain pine, dwarf arborvitaes, etc., etc., forming the gilding to the inner part of the frame, with the taller forest trees as its outer mouldings, and altogether forming, to our mind, a beautiful but simple landscape picture. I am now done, gentlemen, with the simple, practical lesson I am trying to teach. The subject of our essay, coming under the head of landscape gardening, opens up a wide field of investigation to the mind and pen of the master workman, and he that has mastered its intricacies and its higher order of beauties, with artistic skill, I hope, will give you the benefits of genius with a more masterly hand than the humble author of the inclosed pencil sketch.

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ESSAY ON VEGETABLE GARDENING.

WM. MATTHEWS, M. D., MASON, ILLS.

In what I shall have to say in the course of this essay, I shall aim to be practical, rather than theoretical, and shall use language more plain than ornamental. It is *the* fault of many of our writers and authors, that they deal more with the ideal than the real. In the practical everyday walks of life, amateur and fancy work is of small consequence. Men and women, whether they may have undergone the refining process of modern civilization or not, require to be fed and clothed; and in these two particulars, at least, it is questionable whether or not the fashions of the present day have added much, if anything, to the actual comforts of living, when compared with the days of our boyhood—say "forty years ago."

Nearly every family of the "backwoods" in those days had their garden, and in it they usually raised an abundance of the old standard vegetables for their home necessities, and occasionally they could spare a load to supply the town folks, who as a class, have never been, and are likely never to be, remarkable for cultivating gardens and making them profitable. The secret of the success of these pioneer gardeners was doubtless two-fold: First—The soil was fresh and seemed capable of hastening on and maturing rapidly whatever species of vegetation adapted to the climate, was placed on or in it. Secondly—That generation, now nearly extinct, treated upon an average their gardens, and as for that matter, their cornfields too, better than do we of the present day, although we are now supplied with the thousand-and-one of the so-called labor saving implements of modern times. Our fathers, and I may add, our mothers also, worked, to use a common phrase, their gardens thoroughly, keeping them free from weeds, the surface mellow and in a higher state of tilth, while we too much depend upon the fine and costly rakes, horse-hoes, etc., etc., to do our work. I do not, I would be understood, condemn agricultural or horticultural implements, but it is a lamentable fact, which none will deny, that under the old system of culture, when wooden plows, home-made hoes, the flail, reap hook and common hand cradles were in universal use,

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our gardens and our fields yielded more abundantly per acre than they now do, while the taking care of their products did not, on an average, cost so much as similar products do cost now. But enough of this, and now to our task.

My theme is a vegetable garden. The first thing to be considered will be a proper

SITE FOR THE GARDEN.

It is not always in our power to select a favorable piece of ground for the garden. Indeed, it will often happen that we shall be obliged to accept such a piece, be it good, bad or indifferent, as may lay where we would like to locate the garden. The garden should not be so far away from the dwelling as to be inconveniently distant. If we can secure a location very gently sloping away to the south-east, we shall generally have the advantage of earliness of vegetation over that of our neighbors, whose gardens look to the west or to northern aspects. We would not of choice desire the location for the garden to be either perfectly level or greatly undulating. The most favorable postion of the surface would be that, which, while it is too level to "wash" under heavy floods, is still sufficiently inclined to forbid surface water from accumulating upon it. But, as already intimated, when desirable sites can not be obtained, the occupier of the premises will have to accept the situation as it is. If too level, either underdraining or thorough surface draining must be practised; but, if too sloping, it must be cultivated so as to avoid as far as possible the displacement and removal of the soil.

THE SOIL OF THE GARDEN

Should be unexceptionably originally good; but here again unfortunately we shall have no choice, at least in many instances, but shall be obliged to accept such soil as the premises afford. If we could be left free to choose in the matter, we would of coarse select what is commonly styled a deep, moderately sandy loam, abounding in lime, potash, and the debris of decaying animal and vegetable matter. And right here, as properly as anywhere in the course of this essay, I may as well say, that it will be the duty of the gardener to make, where nature has not furnished him with an appropriate soil, to the best of his ability, such a soil as that here indicated, and to labor to maintain it by the annual application of proper fertilizers and manures. The garden should be a sort of Golgotha, into which

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all the bones and useless offal, including ashes of every description, should be cast and covered up. But the very best manurial dressing we can possibly give our gardens is stable and barn-yard manure, freely and unsparingly applied during the dreary months of winter. This is all that I deem it necessary to say with regard to garden fertilizers, as far as the great west is concerned. Aim to return annually to the soil a full equivalent for every mineral thing taken from it—such as lime, potash, &c. These several substances, with others, abound in the material just enumerated.

THE LAYING OFF OF THE GARDEN

Is the next thing in order. Let it be remembered that the theme is a vegetable garden. This being the case, the object then of the garden, is only the production of vegetables. No ornamentation is actually required, yet anybody possessed of ordinary taste will desire to arrange his garden to appear well, and with a view to the convenience of its cultivation. For a common sized family, a garden containing about one acre of land will not be found too large. If fenced off to itself at all, a substantial picket fence will be preferable to most others. A small and a large gate, properly hung, should be accompaniments of every garden fence. A row of currant bushes should be planted a few feet inside the fence on one side, raspberries on another side, and blackberries on another; the fourth side should be left for pie-plant, horse-radish, sage, peppermint, &c. But on no account should any tree or shrub of any considerable size be planted in the garden. At least one-half the vegetable gardens throughout the country are either ruined or greatly deranged by being crowded with fruit trees, grape vines, etc. Both the shade of such trees and the immense draught they make upon the soil are objectionable.

As to the laying out of the garden proper, and apportioning the various stuff to be planted, very little need be said. I would say, reserve at least three-fourths of the ground for potatoes, cabbage, beets, turnips, bunch and pole beans, including a liberal surface for Lima beans, and last, but not least, a patch for both early and late roasting ear corn, together with other minor productions which may be suggested. Of the remaining one-fourth of the garden, it should be set apart for warm beds, lettuce, radishes, onions, early squashes,

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cucumbers, water and musk melons, and again, last but not least, peas, both early and late.

Now, whether the most ornamental or not, it will be the better plan to burn and remove all the trash and rubbish of the last year every spring, after the soil has got into working condition, and, with a common two-horse plow and strong team, break up to a reasonable depth the whole internal area, turning well under all the accumulated fertilizers, the walks, borders and all, always remembering to leave the dead furrows so open and arranged as to afford perfect surface drainage. After a short time, when the soil has become sufficiently warm and friable, with a heavy harrow thoroughly pulverize the entire surface. When this has been done the garden is then ready for the pitching of the yearly crop. The walks may be made to suit the fancy of each individual case, or they may be omitted altogether, substituting spaces only for them to afford turning room for the horse in after cultivation, for let every one cultivate his garden as much as possible by means of the horse and plow, cultivator, harrow, etc. If this is not done, the garden will not likely be cultivated properly. A small space may be well cultivated with the spade, hoe, garden fork, &c., but it seldom happens that a large family garden is kept in good tilth where the labor has all to be done by hand, unless indeed, the labor of one man be given wholly to it, and this thing can be afforded only by the wealthy and impractical classes.

WHAT SHALL BE PLANTED?

The answer to this question has been anticipated. The sole object of the vegetable garden is to raise such vegetables as are in common use on our tables. The potato, both Sweet and Irish, are held in deservedly high esteem everywhere; and the same language will apply, with equal truth, to cabbage and beans. Green corn should be upon the farmer's table at least occasionally from June till October. The Irish potato should, agreeable to my experience and observation, be planted as early (and no earlier), as the ground will work kindly, and should be planted in drills about three feet apart, with a single eye about every eight inches, covering not to exceed two or three inches deep with loose mellow earth. As a general rule, I would plant the entire crop now, and only of early varieties, among which the Rose seems for both productiveness, keeping qualities, and excellence of flavor to stand first. Ordinarily the early potatoes,

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properly handled, keep well until the new crop comes in. But the two principal reasons for planting early varieties only, and early, are, they generally mature before the severe summer droughts come on; and usually are so far advanced before the appearance of the potato bug as to be measurably beyond its power to destroy. Peas, lettuce, radishes, and a few other hardy species of garden vegetables should, also, be planted as early as the ground and spring weather will permit. *How* these things, together with others which are to follow them in gradual succession are to be planted, I need only indicate. The ground should be got into good condition, and as a general rule, the seed covered quite shallow, though peas, it is proper to say, may with safety and sometimes advantage, be covered four or six inches. A comprehensive and safe rule is, to plant every thing in season, not too early, neither too late. The sweet potato (and it will nine times in ten be better to buy the sprouts than to attempt to raise them), should not in this climate, be transplanted before about the middle of June. It is best for them to make small hills, and set a single plant to each, and increase the size of the hill in cultivating, by drawing the dirt to it. And one other remark about the sweet potato, it is proper to make—plant it on the poorest part of the garden. It loves a thin warm soil.

Now, I deem it would be nearly an insult to the intelligent readers of this essay, for me to go on almost *ad infinitum* to tell them how to plant all the various seeds and tubers necessary to complete a good, practical family vegetable garden; for, I am not writing for the benefit of market gardeners. It is sufficient to repeat, what has already been several times intimated or declared, that all garden seeds and tubers, should be planted at the appropriate time to suit each particular variety, and that they all should be properly covered with, and in, a fine, mellow, friable soil. This done, the next most important, and indeed all-important step, is,

THE AFTER CULTIVATION OF THE GARDEN.

The cause, of all others the most frequent, of failure to secure good and profitable yields from gardens, is *a lack of proper culture after planting them.* One may see every year of his life fine garden prospects let go to weeds and ruin for want of a little timely labor. "There is no excellence without great labor," is just as true in horticulture as in literature. In gardening we must take the ox by the horns, and promptly root up every weed as it appears, and stir the

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soil late and early, with a view of keeping it mellow, so that even the dews of heaven may enter it and breathe their revivifying breath upon the otherwise famishing roots of the family garden. In a garden laid out with a view to economy and profit, a large amount of the after cultivation may, and should, be done by and with the horse. But still, the hoe must not be ignored. The old Virginians were wont to hoe their entire corn fields, and, indeed, it often paid them to do it. The Southern negroes, under their task masters, were not many years ago compelled to hoe by hand their great cotton fields, and experience taught the proprietors, that the enhanced crop more than paid for the tedious process. So it is with our gardens. After doing all that can possibly be done with the horse, hand labor will still be required and the products of the garden will be so increased thereby as to prove highly compensatory. The potatoes, corn and many other things may be mainly cultivated by means of the plow, the cultivator and harrow, but to complete the work the so-to-speak, intelligent hoe must be resorted to. Most of the hoeing may be done at odd and spare times, and by those who do but little other out door work. An hour late in the evening or early in the morning, spent by our daughters in the garden with a bright hoe in their hands, if not so elegant as piano practice, will be found by them more healthful and more profitable to both family and themselves. The boys, too, should be required to spend a portion of their mornings and evenings in the garden, at work. Nor would it be detrimental to our wives to imitate their grandmothers' examples in this matter. Labor, but not slavery, is the normal condition of all well regulated society. Instead of a disgrace, every one should esteem it an honor, no less than a duty to give a portion of his time to physical labor. God has denounced it as a penalty against us all, and that man is the happiest who least attempts to escape it. It is as binding as the Golden Rule itself. God loves the cheerful worker!

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ESSAY ON VEGETABLE GARDENING.

BY W. H. WHITE, SOUTH WINDSOR, CONNECTICUT.

NOTE.—This valuable paper was written for the Society's prize, but having been lost in the mail, did not come to hand in time to be placed in the hands of the awarding committee. Failing, therefore, to draw the prize which it doubtless would have merited, it would have fallen back, under the rules of the Society, to the writer as his property. He has however kindly offered it to us for publication, for which we extend him the thanks of the Society. "SECRETARIES."

THE VEGETABLE GARDEN.

No one living in a civilized community, I think, will question for an instant the value of a good garden containing a choice assortment of nice, fresh vegetables in variety, and their desirableness at the close of a long winter and the approach of, and during the warmer seasons following, and intervening. But with all this desire there is a want of general success in improving advantages within the reach of all farmers and rural residents.

It is not necessary for me at this day of advanced enlightenment and rural improvemet to expand upon the sanitary and moral advantages of every family having, and using plenty of fresh vegetables, and of raising them themselves, on their own ground; this I defer to abler and more prolific pens than mine, and proceed at once to the

LOCATION AND ASPECT OF THE GARDEN.

A vegetable or kitchen garden should be located conveniently near, and of easy access to the kitchen, with a good and suitable dry walk at all times, leading thereto; so that the female portion of the family may be able to go and come comfortably, without undue exposure. The garden should be enclosed with suitable fence, with gates suitable for access with team as well as for persons of the family. For the greatest profit there should be some little variety in the soil, light and warm for early, and that of a moist and

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heavier nature for certain other varieties of vegetables, etc. Where a choice is to be had a gentle descent to the south—which will usually give variety of soil sufficient—presents the best aspect; such exposure is less objectionable on account of injury from a morning's sun after a frost or freeze, than a more easterly one; as the first rays of the morning sun, which are often the most destructive after a freeze, do not fall direct on the plants, but the frost is gradually drawn out before the sun's rays strike them direct, thus oftentimes escaping the ill effects entirely of a moderate freeze, from untimely frosts, or winter freezing and exposure.

It is always advantageous and advisable to have the garden protected from prevailing cold winds, etc., by natural obstructions of hills or woods, or artificially by a tight high board fence, wall, buildings, or other wind-breaks; thus protected, there will be several days difference in earliness in their favor over unprotected grounds.

SOIL.

The very best soil is a loam, having just enough sand in its composition to prevent its packing or baking hard after a rain, free from stones to interfere with the cultivation of the most tender and weak plants; having sufficient vegetable mold to give it a dark color, as a dark colored soil absorbs the heat of the sun more readily than a light colored one, and is warmer. A deep soil is requisite for successful gardening, and is especially so for the roots and many kinds of vegetables. Much also depends upon the nature of the sub-soil, as if a coarse sand, or gravel, it will be liable to leach; if a compact clay or hardpan, it will retain too much water, and will need underdraining, &c.; while a loam sufficiently porous to admit the passage of water will drain itself and yet retain the pabulum of the plants. The soil should be naturally dry or made so artificially, by draining, as not to retain water near the surface, to be evaporated, as such is apt to be cold and sour. A means of ascertaining this point is to dig post holes in any uncertain point three feet deep, and if no water is found or settles into them it will answer, otherwise it should be underdrained.

SUB-SOILING AND TRENCHING.

As an accompaniment of underdraining, to make it prove most effectual, subsoiling, or trenching is essential, as well as to the best

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developement of plants in any soil. Subsoiling is performed by following the surface-turning plow with the subsoil plow, in the same furrow as turned, loosening and breaking the ground below without turning, similar to the action of the ground-mole as he works his way through the ground. In order to be the most effectual and thorough, the surface plowing should be done with a narrow furrow slice; this will give the subsoiler a chance to pulverize the whole subsoil. The deeper the ground is pulverized and fertilized the greater the capacity of the soil for production and the less it suffers from either wet or drought; and to make a good garden the soil should be well mellowed, not less than twenty or twenty-four inches.

But the gardener who is not satisfied short of the very bes results from his ground will resort to trenching, even though it may require extra expense and labor. Trenching may be done thus: Take a good light and strong long-handled spade, strike a line across one side of your ground and open a trench two spades wide to the full depth of the blade, throw the soil over the line, then run the spade full blade deep into the under soil, raise, loosen and fine it, dropping it back in place; open another trench the same width and in the same manner, throwing the top-soil on the first open trench; proceed thus till the whole ground is trenched; when you come to the last trench take a wheelbarrow or wagon and cast the upper soil thrown from the first dug trench and fill it into and on top of the last, spreading it in an even manner through the same. A hand, active and accustomed to using the spade will trench a large garden in this way, making quite rapid progress; and when it is done it will not need repeating for several years. Much subsequent labor will be saved, and much more satisfactory results will be attained by the thorough preparation and fertilization of the garden spot.

MANURE.

Crops grown and removed from any ground in succession will eventually impoverish a soil, and are always better and the fertility of the soil preserved by proper fertilizing, however rich the soil may be at the start. It is better to prepare the garden spot in the fall; after plowing or trenching as above drawn on well rotted and fine farm yard manure, devoid of weed seeds, at the rate of twenty two-horse loads—don't scrimp them—per acre, spread it evenly and plow it down six inches deep, then at the approach of freezing

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weather, haul on and spread evenly fifteen loads more per acre, let this remain till spring, when it should be plowed down eight inches deep and the whole be mixed by thorough plowings, and cultivating with the horse cultivator or harrow so as to mix the manure and soil evenly and thoroughly. All this unless the soil is quite rich to start with when a little less manure may do, but for average soils the full quanity will be needed and on some a larger quanity. Some portions of the garden will not need to be thus manured annually, but for the most part it should be so done, using a sort of rotation of manures, as stable manure, farm yard manure, compost, night soil, etc.

GARDEN IMPLEMENTS.

A few light and durable implements should be the accompaniment of every garden; and first, there should be a "reel" and "line" for laying out the garden properly. A wood reel will answer, but an iron one is better; the line of hemp at least six rods long, and one-fourth of an inch in diameter, this ought to be marked in feet and fractions of a foot. A spade, shovel and digging fork; spade for digging turf, etc.; shovel for moving turf and earth; digging fork for the more perfect pulverizing of the soil of beds, etc. Drill markers, two or three for marking drills, of different widths, or an adjustable one, where it is desirable to plant seeds in drills, or even in hills it is convenient, at equal distance and in straight lines; they should be constructed so as to mark drills, or rows, at different distances from six to thirty-six inches, or more. They can be made of wood cheaply yet durable, and all may be in one by making the head with holes for the teeth at desirable distances and having the teeth so that they may be removed or others inserted as necessary to give the right width between rows. A good steel rake is necessary for fining and evening the soil of beds, etc., and is one of the very best substitutes for the hoe in hoeing. A hand roller will be found very useful in compacting the surface where seeds are sown. A hard wood one, a foot in diameter and two feet long, answers the purpose; or an iron one may be had at the stores. Good steel hoes, light, yet strong, of the very best, are the cheapest. Pronged and skuffle hoes are very useful and almost indispensable for weeding, etc. The garden trowel is another very useful, small, hand implement, useful in transplanting, etc. The small hand weeder is very useful where weeding by hand is required. A hand drill is also useful for sowing seeds in drills, from turnip seed to peas, beans or

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corn, where any quantities are to be planted. A good watering pot of the strongest and best make of xxx tin, with a fine rose sprinkler, and holding twelve to sixteen quarts is needed for watering weak, as well as stronger plants. A good wheelbarrow with wide wheel is a valuable accessory for moving any heavy material about the garden, and indispensable to any well ordered one.

HOT-BED AND COLD FRAMES,

Are valuable adjuncts; and at the present day no good garden can be complete without one or more for starting, raising and wintering vegetables. To obtain early vegetables, in our climate, it is necessary to use some artificial heat, such as is commonly derived from the fermentation of heating substances in the hot-bed, concentrating and confining the heat while the light and heat of the sun is admitted and made to do service, and the cold shut out by means of a frame and glass. I have found the following a good way of constructing hot-beds: Dig a pit, where it will have the full exposure, light and heat of the sun during the whole day, running East and West, eighteen inches deep, five feet wide, and as long as there are sash to cover. Make a frame of one and a half inch stuff, two feet high for the back, and one foot high for the front, with ends sloping to match, of length and width to accommodate your pit and sash; batten tight all cracks. The ends and back should be rebatted to accommodate the sash, which may slide on the front; strips should be fastened from front to rear for the sash to rest, and slide on and cover the joints between the sash. The sash should be six feet long, and wide enough to take in four rows of 8x12 glass, and strong enough not to spring; be made of the best of white pine without the usual cross-bars for the glass; the glass should lap one-quarter of an inch instead, without putty between, being strongly puttied at the sides; and with the frame well painted outside and in—inside with white paint. The middle of March or first of April is soon enough to start the hot-bed in this latitude commonly. Use horse manure for heating, containing considerable litter, leaves mixed in fresh, make the heat more lasting, fork it over once or twice, a week or two in advance, to induce fermentation, breaking up lumps, etc. Fill in your trench, making the bed of manure even and level, two feet deep; set on the frame, banking it up well, put on your sash and let it start a fermentation for a day or two, then spread on your loam evenly, five or six inches deep—

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the loam should have been procured, fined and sifted in the fall, and covered with straw or manure to prevent hard freezing and to be got at when wanted—after putting on the loam replace the glass, let the heat rise, it will go to 100° or more, wait till it begins to subside somewhat, and then sow your seed. Strips should be nailed on the ends, inside, of the frame to lay a plank on for convenience of standing on to sow and weed. The hot-bed will need close attention from the time the seeds start till the plants are all removed; in cold and freezing weather it will want covering with mats or straw, in sunny warm days it will need shading or airing, or both, and will need frequent watering with tepid water at all times; watering should always be done after the sun passes the meridian, after two o'clock P. M., otherwise there will be too great evaporation. Cabbage, cauliflower, egg-plant, lettuce, tomatoes, peppers, etc., may be sown quite thickly in three inch rows running from front to rear; to forward cucumbers, beans, corn and squash, to be transplanted, cut sods from clean turf five to six inches square, three to four inches thick, place them in the bed, soil side up, directly on the manure; set a stick in the center of each and sow six to twelve seeds on each, placing none within an inch of the edge; spread soil-loam evenly over the seed to the usual depth of open-air planting and press down gently. After the plants have put out their rough leaves, thin to the number desired in a hill, keep well watered, and transplant when there is no further danger of freezing or frosts, middle to last of May. Weeding should be done on mild days when the sash may be opened; and great care must be exercised not to let the heat rise too high or to keep the bed close in a bright, hot sunny day, as well as to give the plants suitable space by thinning or they will be burnt or drawn, hence the necessity of good ventilation when clear and warm.

Cold frames are used for preserving cabbage, cauliflower and lettuce plants over winter and forwarding plants in the spring, for pricking out plants into from the hot-bed, etc. They are merely a box frame covered with glass set over a well prepared bed of soil without any heating material under. The frame is made by nailing two boards, running parallel, to posts, the back one ten to twelve inches wide, and the front seven to eight inches, to give the sash pitch to carry off the water; the ends are made tight to correspond. They should be placed in a sheltered locality exposed to the sun. They require the same care as to ventilation, etc., as the hot-bed, but require more air in order to harden off the plants; they are not used for forcing but more for protection and making a healthy

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growth of the plants that would not stand exposure so early in the season.

A set of head glasses, boxes covered with glass, or boxes without a top or bottom covered with fine gauze to set over plants for protection from cold, insects, etc., will be found very useful for those purposes.

LAYING OUT THE GARDEN.

"Order is the first law of Heaven," and it is always more pleasant to the eye as well as much more convenient and economical to have a garden orderly and neatly laid out than otherwise. A vegetable garden should never have any portion of it devoted to trees, or anything that will shade the vegetables, for they require the full light and heat of the sun, as a general thing, for their healthy development. I would have a border extending around the outside of the garden, four feet wide, next the fence, devoted to biennials and perennials; rhubarb, asparagus, sage, and other sweet herbs, etc. Inside of this a good broad permanent walk and another good broad walk through the middle, running lengthwise of the garden. If the garden is quite large, it is more convenient to plant in rows to cultivate with the horse and cultivator; but it is for the more general farmer's garden that it is my aim here to provide, and these will hardly admit of the horse culture; therefore I would lay off the garden in squares about two rods in length and separate them by temporary narrow paths. In making walks, draw your line on either side, and tread down the soil with the feet, between; this will not sink them too low, as hauling out the soil will; smooth up the edges with the hoe. Select the warmest part of the garden with the lightest soil for those tender early plants which require the greatest warmth, care, etc.

SEEDS.

For an average garden, there is no one thing of greater importance to the successful culture of vegetables than that of "purity" and "healthiness" of seed; and for this reason every gardener ought to raise, so far as practicable, his own seed; but in doing this, care must be exercised not to grow different varieties of the same family in near proximity, or they will mix. Seeds from all annual plants should always be taken from the finest, healthiest, and earliest ripening specimens; from only healthy, well developed plants. Seeds vary in the time which they retain their germinative properties.

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Parsneps, peppers, onions, leeks and carrots, are not sure after one year old. Beans, peas, egg-plant, okra, thyme, sage, salsify, and rhubarb retain germinative qualities, good two years. Those safe for three years, asparagus, lettuce, radish, endive, parsley, and Spanish cabbage. Cauliflower, broccoli, turnip and celery are safe four years. Beet, corn, cucumber, melon, squash and tomato, retain their vitality the longest time, ranging from five to ten or twelve years; yet all seeds depend largely on the care in keeping for the time they will preserve their vitality. For our garden we shall need seeds in variety to the following amount:

Asparagus, 2 oz.; carrots, 1 oz; citron-watermelon, 3 oz.; radish, 4 oz.; beans in variety, 4 oz.; celery, ¼ oz.; watermelon, 3 oz.; salsify, ¼ oz.; beets in variety, 4 oz.; sweet corn in variety, 2 qts.; okra, ½ oz.; squash, in variety, 4 oz.; broccoli, ¼ oz.; cucumber, 2 oz.; onion, 1 oz., spinich, 4 oz.; Brussels sprouts, ¼ oz.; egg-plant, ¼ oz.; potato onions, ½ bu.; tomato, ½ oz.; Cauliflower, ¼ oz.; lettuce, in variety, ½ oz.; parsnip, ¼ oz.; turnip, in variety, 2 oz.; cabbage, in variety, 2 oz.; muskmelons, 1 oz.; pepper, ¼ oz.; peas, in variety, 4 qts.

I give these as leading varieties of vegetables. Aside from these there are many varieties which the amateur gardener will desire, and some that are desirable in every garden, such as sweet herbs, mustard, etc. These will require but a small quantity of seed each.

SEED SOWING AND PLANTING.

The starting point of all cropping is depositing the seed in the soil; and unless a thorough knowledge of the requirements and conditions for the germination of the different varieties is had, many failures will be met with by the inexperienced. The seeds of different varieties of vegetables germinate at different temperatures, and their requirements are different in several respects; some may be planted and will survive and germinate, when the thermometer indicates forty-five degrees in the shade, while others require a temperature of sixty degrees under similar circumstances. Some seeds will not germinate and grow in one soil, while in a different soil they succeed perfectly; other seed will germinate and grow in any soil; and all do best when the soil is in just the right condition, and the seeds are properly deposited. It is always safest to plant seed enough, so that there be no failure from the plants standing too thin, and when the rough leaves are put out, and bugs, etc., are feared

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no more, thin out to the requisite thickness. The requisites of germination are moisture, warmth and air; if any one fail the seed fails to germinate, or the plant to grow.

Rotation of crops in the garden is as important for success as on the farm, the reasons why crops do better rotated are not so plainly established; many theories have been advanced, but is not for these we have here to do, but rather a good practice. The following will be a safe guide to follow in planting: Plants of the same species or family, should be planted to succeed each other. Perennials which occupy the same ground for several years, should, when changed, be succeeded by annuals. Crops grown for their foilage should be succeeded by crops grown for their tubers, bulbs, or roots.

TRANSPLANTING.

To the better development of many varieties of plants, they are started in a seed bed, to a certain point, and then transplanted into more open space; this operation is an important one, requiring judgment and skill to its successful performance, as well as certain conditions of plant, soil, and of the atmosphere. Experience in the art, state of the plant, atmosphere and soil are the only reliable teachers in this, as in all other operations of the garden; yet a few hints will be found useful. The plants must be cared for, kept wed, etc., in the plant bed, and when removed, be carefully dug, retaining all their roots and fibres entire. Transplanting is best done when the atmosphere and soil are moist; but when these conditions are not available, it may be done in the afternoon and then watering the plant and soil after setting. The plant should attain a suitable size, have a stout stem, and good strong fibrous roots before transplanting; it is quite important that the soil into which the plants are transplanted should be fresh stirred, as the moist soil will induce the rapid formation of root fibres, whereas if the plants wilt from dry soil, they are long recovering, if they do not fail entirely; it is better to transplant so as to avoid watering when possible. Open a hole with a dibble or the fingers, sufficiently large enough to hold the roots of the plant, as they grew in the seed bed, insert them in their natural position, and fill in around them with fine, fresh moist soil, and gently press it about the stem and roots, and let the plant stand a trifle lower, when finished off, than when in the seed bed. If transplanted in continuous dry weather the soil will need more firming around the plants than if done in cloudy moist weather. The

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proper firming of the soil about the plants is one of the points where failure is met with, and many plants are annually lost from this cause alone, in transplanting.

GENERAL CULTURE.

It may not be amiss here to say that, in order to attain eminent success in the vegetable garden, everything should be thoroughly well done, and seasonably. Successive crops must be provided for, and every vacant space must be filled; no weeds or useless plants must be allowed to grow; early maturing crops must be succeeded by some other crop which may mature on the same ground the same season; the soil must be kept stirred, fresh and mellow, about all growing plants, and wherever necessary, watering with clear water or liquid manure must be done, all requiring good judgment, in order to prove effectual. Remaining space must be devoted to special culture of vegetables and plants.

ASPARAGUS CONOVERS COLLOSSAL

Is the latest, largest and most desirable sort, growing to an enormous size. Sow the seed very early in spring in drills, fifteen inches apart and one and a half inches deep; cover with fine soil and roll. When fairly started, thin to three inches apart. Cultivate frequently by running the skuffle-hoe between the rows, and pull out all weeds by hand in the rows. In good, rich soil, prepared as directed above, the roots will be sufficiently large to transplant at one year old. As soon in spring as the ground will work well, measure off a bed of desired length on your border, and dig in a heavy coat of manure and forty pounds of salt to the square rod. Mark off two rows on your four foot bed, and set your plants two feet apart in the row. Cut your trenches for the plants a spade wide and deep; take up the roots carefully and set them in the trenches, spreading the roots well, and cover, so as to leave the crown four inches below the surface. Keep the bed free from weeds and the plants growing, and in November cut the stems and clear them off, and cover the beds three-fourth inches deep with coarse manure. The following spring rake off the coarser and dig in the finer manure, as deep as you can do without injury to the roots, and repeat the previous year's culture, etc. The following, or third year, the cutting may be pretty generally of the strongest shoots when they make a growth of six inches; cut two-third inches below

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the surface. It is best not to continue cutting too long, or you will exhaust the roots; the middle of June is usually late enough, when other vegetables begin to come in. It will pay to dig in a sprinkling of good superphosphate in the bed when the cutting ceases.

BEANS—DWARF OR SNAP.

Desirable sorts are: Dwarf Wax, Early Valentine, Mohawk, White Kidney and Early Marrowfat. Plant late in April for the first crop, and once in two weeks thereafter to the first of July. Plant in drills two inches deep and eighteen inches apart, or they make very good borders for your squares.

POLE OR RUNNING BEANS.

Desirable sorts are: Large and Small Lima, Dutch Case-knife, Red and White Cranberry, Scarlet Runner, Frost and Giant Wax. Plant in hills three and a half feet apart both ways, after fear of frosts are past, set eight feet poles firmly in the ground, and plant six or eight beans around each, and cover one inch deep, except Limas, which should be stuck eyes down and covered half an inch; none should be placed nearer than five or six inches of the pole to keep away from the drip, or they may rot.

BEETS.

Desirable sorts are: Extra Early Turnip, Early Blood Turnip, Long Blood. They require a deep, rich soil. Sow in eighteen inch drills, covering one inch deep, the early varieties as early as the ground will work well; thin to six inches apart. Stir the soil frequently, and keep clean of weeds. For fall and winter use, sow the latter part of spring. Packed in boxes or barrels, in sand, and stored in the cellar, they may be preserved through the winter.

BROCCOLI.

Standard sorts are: White Cape, Purple Cape, Early Wolchren and Knights Protecting. Sow in shallow drills, twelve inches apart, as soon as the ground will work in the spring. Transplant in well prepared hills in June, two feet apart each way. Cultivate same as cabbage; commence to use in October.

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BRUSSELS SPROUTS

Are treated with the same culture; need be touched with frost before they are good to eat.

CABBAGE.

Desirable standard sorts are: Early York, Large York, Early Ox Heart, Early Winningstadt, Early Flat Dutch, Marblehead, Mammoth Drumhead, Large Flat Dutch, Green Globe, Savoy, and Red Dutch. The earliest cabbage are had by sowing the Early York seed in September, in three inch drills; keep them well weeded, and, upon the approach of cold weather, transplant into cold frame beds, where they are wintered. Soon as all danger of hard freezing is past in the spring, transplant into well prepared, rich open ground, eighteen inches both ways. Plants grown in the hot-bed may be brought forward nearly as early with less trouble. Sow seeds of the latter sort in rich beds of soil the last of April, or early in May, in rows twelve inches apart; keep them clean and the ground well stirred, and, by the middle of June, they will become good, strong plants. Select the largest and strongest to transplant first; the smaller ones will come in for later. Transplant into rows two and a half feet apart and two and a half feet in the row, and cultivate once a week until the cabbage heads. In transplanting, set one half the stem in the ground, and then cultivate level and often. Unless transplanted in moist weather, wet the plant bed thoroughly an hour or two previous to taking out the plants, carefully remove them, and well water what are left in the bed taken from. See directions for transplanting above.

WINTERING CABBAGE.

Some may be stored in the house cellar, setting them closely on their roots on the cellar bottom, free from contact with the cellar wall; but the better way is to have a tight cellar under some of the outbuildings, especially for strong vegetables, where they will keep just above the freezing point. In the absence of such a cellar, a variety of ways of constructing pits for safe storage are practiced and may be chosen from. A good way of preserving cabbage over winter, I have found to be, is to bury them heads down in the ground, and then cover with boards, stalks, or like. Dig a trench wide enough to admit the heads, and deep enough to only leave the

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roots out, when filled, on dry, well drained high ground, and set your cabbage head down in the trench, throw in a few corn stalks, or straw, and cover eight inches with dirt, leaving the roots only out; over these throw stalks or straw, or make a roof by nailing two boards together in the form of an inverted V, and placing over. If well covered with stalks, etc., they may be got to at almost anytime during the winter, or they will keep until spring, and come out fresh and crisp.

CARROTS.

Desirable sorts are Early Horn, Long Orange, and Altringham. Sow Early Horn in April for early table, and last of July for late crop. For main crop, sow either of the others in the month of May, twelve inches apart. Commence to weed and cultivate as soon as the rows can be distinguished by the plants, and keep a sharp lookout for weeds; thin to three-fourths inches apart. Just before the ground freezes, take a sharp hoe and cut off the tops half an inch above the crowns, and dig with the digging-fork. Preserve for winter use same as directed for beets; any surplus may be buried in pits for feeding to milch cows in spring.

CAULIFLOWERS.

Desirable sorts: Early Erfurt, Early Paris, Half-early, Wellington, and large Late London. The culture is the same as for Cabbage, taking a little more pains, and you obtain a much more delicate luxury. They are more impatient of drouth than the Cabbage.

CELERY.

Standard sorts are Incomparable Dwarf, Boston Market, Seymour's Superb, and Dwarf Red. Sow in early spring, in a rich, well prepared seed-bed. Water frequently, and protect from frosts; thin plants to three inches. Late in July dig trenches one foot deep and wide, dig into the bottom three inches of good rich manure—cow or hog—and set your plants nine inches apart in the trenches: cultivate to keep down the weeds, and the soil loose; in five or six weeks begin to earth up, so as to blanch. This is done by closing up the leaves, and hauling the soil up to the stems or leaves, using care not to get any dirt into the heart, as it will injure the plant. Earthing is only done when the plants are dry; when wet, it will cause rust, etc. Continue to earth up at intervals of six or ten days,

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and when the celery has completed its growth draw up the earth to the top of the plants. It may be preserved for winter by standing it up in a box in the cellar, with dirt between them. It should not be dug or handled when frozen; always gather before hard freezing, although a considerable degree of frost does not injure it.

CORN.

Desirable sweet sorts are Crosby's Early Sugar, Farmer's Club, Dwarf Prolific Sugar, Asylum Sugar, and Stowell's Evergreen. Plant early in May in hills, manured, three feet apart each way, in mellow, rich soil; stir the soil frequently, for rapid growth. Plant for a succession, and once in ten days, up to the 10th of July.

CUCUMBERS.

Standard sorts are White Spined, Early Frame, Early Cluster, Green Cluster, and Long Green. Plant in May in open ground, in hills four feet each way; manure well in the hill with fine old compost, and raise the hills slightly, making them broad and flat. Protect from striped bug, etc., by hand-picking early in the morning, or covering with frames and gauze; when the rough leaves are well pushed, thin to four plants to the hill. Pinch off the ends of the vines, if inclined to run together too much. Pick off the cucumbers as fast as they arrive at suitable size, as they continue in bearing longer, a hill or two may be left for growing seed, allowing only four to six specimens of the earliest, and those near the root, to ripen. Plant again the last week in June for pickles. Cultivate freely until the vines interfere; then pull all the weeds.

EGG PLANT.

Varieties: New York Improved, Long Purple, Large Purple, Scarlet Fruited, and White Fruited. Plant seeds in the hot-bed early in April; and transplant into rich, warm, mellow soil, two-thirds of a foot apart, according to growth, early in June. Good thorough culture pays.

LETTUCE VARIETIES.

Early Curled Simpson, Early Curled Silesia, Green Winter, Butter, Curled India, Tennis Ball, White Cos, and Large Indian. For

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early, sow in hot-bed in March, and transplant early in April, into rows twelve inches apart and six inches in the row. Sow in the open ground once in four weeks for a succession. Frequent hoeing and watering with liquid manure will promote rapid growth, upon which it depends for tenderness, crispness, and goodness.

MUSKMELON AND CITRON.

Varieties: Skillman's netted, Borneo, Green Citron, Jenny Lind, and Nutmeg. Plant in the middle of May, in hills six feet apart, with a large shovelfull of well-rotted manure to the hill; cover the manure with soil half an inch, sow eight to twelve seed in each hill, and thin to four plants when rough leaves are put forth; cultivate as for cucumbers, using the same means for repelling striped bugs, etc. As this variety of fruit crosses so freely, great care must be exercised in saving seed. Varieties should be widely separated—not less than twenty rods—where seed are saved from.

WATERMELONS.

Good varieties: Mountain Sprout, Black Spanish, Ice Cream, and Orange. Plant in hills eight feet apart each way, giving the same culture as for muskmelons. A lightish sandy loam is best suited for watermelons; heavier soils are apt to grow too much foliage.

NASTURTIUMS.

Varieties Tall and Dwarf. They will grow well in almost any kind of soil. Sow last of May or early in June, in drills two and a half feet apart; cover an inch deep; thin to twelve inches. Give support of trellises or brush, etc., for tall growing varieties.

OKRA.

Varieties are Dwarf and Tall. Plant latter part of May, in drills three feet apart, and thin to fifteen inches. It is of the easiest culture, grows freely, and bears abundantly in ordinary garden soil. It is grown for its long pods, which are believed to be very nutritious in stews, soups, etc.

PARSLEY.

Varieties are Dwarf Curled and Moss or Fimbriated. It may be sown between the rows of lettuce at the same time, and given about

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the same culture. The seeds are slow to germinate, appearing about the time the lettuce is removed. Useful for garnishing, soups, stews, etc.

ONIONS—DESIRABLE SORTS.

Wethersfield Red, Yellow Dutch, Silver Skinned, Yellow Danvers. Potato, and Top or Tree Onions. The ground should be rich, and as free of weeds as possible. Sow as early in the spring as the ground will work in drills one foot apart—they do the best on the same ground several years—cover the seed one-fourth of an inch with fine loam. Keep down weeds by hand weeding and the skuffle hoe. When the season's growth is matured, pull and throw in shallow heaps for a week or so, then top and store; spread in a cool building till freezing weather, when they may be barreled and kept where the temperature is just above the freezing point. The potato onion is the mildest and best for family use; plant in the spring in rows fifteen inches apart, and eight inches in the row. They will be ripe in July.

PARSNEPS.

Varieties: Hollow Crowned, Guernsey, and Long White. When the soil is dry in spring sow in drills eighteen inches apart, and lightly, and then thin to four inches apart. Cultivate thoroughly and deep. Parsneps are best wintered in the ground and dug in the spring, as wanted, before the growth begins.

PEAS.

Desirable sorts are Daniel O'Rouke, Extra Early, Tom Thumb, McClean's Advancer, Champion of England, Black and White-Eyed Marrowfat. Plant Extra Early, Tom Thumb, or Daniel O'Rouke, as soon as they can be got in, in spring; for early in drills two feet apart; the taller and larger growing varieties four feet apart, double drills for bushes, cover two inches deep. Varieties requiring bushing should have double drills ten inches apart, and four feet rows, for brush to stand between. White birch cut to length, and weighted down in piles, make good supports for peas. After the first dressing with the hoe set the brush, and weave the tops together along the row. These vines incline to the brush better if set early than if set late. Keep the soil loose and mellow around the roots, and all the weeds down by frequent culture.

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PEPPERS.

The best varieties are Bull-Nose or Bell, Squash, Sweet Mountain, and Cayenne. Sow in hot-bed in April, or in open air in May. Transplant the first of June eighteen inches each way.

POTATOES.

Early Rose, Early Sebec, and Mercer, are the best varieties. Only early potatoes should be planted in the garden—the field is the place for the general crop. Plant as soon in the spring as they can be got into the ground in good condition. A dry, sandy, rich loam is the best for early potatoes. A mixture of eight of ashes, two of plaster, one of salt, and one-half of ground bones, makes an excellent fertilizer in the hill; a small handful to each hill, on or under the seed. Plant in the hills two and a half feet each way, and six inches deep. Hoe and keep clean of weeds; stop cultivating when they blossom. When the tubers will crack in boiling, they will do to commence to dig for eating. When fully ripe dig with the digging-fork, and store them in a cold, dark cellar.

SWEET POTATOES.

Sprout the tubers by laying them on the manure in a part spent hot-bed in the middle of April. Last of May draw the sprouts and set in open ground. Mark out rows north and south, three and half feet apart; scatter the horse manure along the marks; cover, by ridging, six-eighths of an inch deep; make the top of the ridge four inches wide, and set the slips on them eighteen inches apart; set the plants down to their first leaves; cultivate to keep down weeds. Dig at the first frost, or cut the vines; dry, and store in a warm, even temperature.

RADISHES.

Desirable sorts are Long Scarlet, Short Top, Scarlet Turnip, Scarlet Olive Shaped, Long White Naples, White and Black Spanish. Sow as early as possible in spring, and once in three or four weeks for a succession till August. Rapid, quick growth makes the most tender and crisp radishes; liquid manure and frequent culture promote this.

RHUBARB.

Varieties, Linnæus, Victoria, Cahoon, Prince Albert, and Early

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Prolific. Sow seed in spring, in drills eighteen inches apart, one inch deep. Transplant in early spring into rich, rather moist soil, four feet each way. Cover with manure every fall, and dig it in about the roots in spring. Placing a headless barrel over the roots, and banking up around with horse manure, will cause the plants to come forward much earlier in spring. In gathering for use pull the stems with a sideways jerk; leave several stems to each hill to maintain the vigor of the roots. Cut out all seed stalks as soon as seen.

SALSIFY, OR OYSTER PLANT.

Sow in drills one foot apart, and thin to four inches. Cultivate same as parsnips. Leave in the ground over winter.

SPINACH.

Varieties: Round, Prickly, and New Zealand. For early spring use sow in August and September. Scatter a little straw over the bed at the approach of winter. Sow early in spring for summer use in fifteen inch drills, and thin to six inches. When the outer leaves are two or three inches broad gather for use, leaving the inner ones to grow.

SQUASH.

Desirable varieties are: (Summer), Early Golden Bush, Early Scallop Bush, Summer Crookneck, and Boston Marrow. (Fall and Winter), Hubbard, Yokohomo, Winter Crookneck, and Vegetable Marrow. Plant early in May; bush varieties, four feet each way, others six feet, and cultivate same as cucumbers and melons; use the summer varieties before the shell becomes hard. Gather the winter varieties before frost touches, and store in an even temperature, without piling them on top of one another.

TOMATOES.

Varieties: Early Smooth Red, Cook's Favorite, Gen. Grant, Tilden, Large Red, and Fejee. Sow in hot-bed middle of March to April 1st, in rows four inches, and thin to same distance in the row. Give air to harden and prevent the plants being drawn, and if they are likely to make too much growth prick out into cold frames, and after cold weather is past transplant into rows four feet each way. Transplant with care, setting the plants two inches deeper than they stood in the hot-bed. Give frequent hoeing, each time drawing a

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little earth around them forming a broad hill. Pinch in the side shoots beyond the first blossoms, and train the main stem to a stake. Properly cultivated, and thus trained, they will ripen their fruit by the middle of July, and there will be more mature fruit and that which is better, than if left to grow as naturally inclined. If gathered when most plenty, and canned, they may be enjoyed the year round.

TURNIPS.

Desirable sorts are: Early White Dutch, and Purple Top Strap Leaf, for early; for late winter and spring, Yellow Aberdeen, and Laing's Purple Top. For early use, sow as early as possible in spring, and again the last of July. Sow Laing's and Yellow Aberdeen in July and the first of August, in drills two feet apart, and cover the seed quarter of an inch deep. Gather, top and store, in vegetable cellar, before hard freezing; slight frosts do no injury.

I have enumerated and given brief directions for the culture of many of the more useful and common varieties of vegetables, that it is desirable to cultivate in the vegetable garden for the ordinary family supply. But, unless the gardener is vigilant in care, plants for succession to fill the whole season, occupying every inch of ground, and when one early crop is gone, plants the same ground to another, the greatest profit is not derived from a garden. From general rules and hints, the gardener must derive rules, etc., adapted to his special circumstances, and then apply them, working carefully and thoroughly. The science must be applied to practice, or it is of no avail.

All work should be done in a neat and systematic manner; have all rows and paths straight, his curves true and regular, and then he will delight to view his garden himself, and will not be ashamed to have others inspect it. He should have a dry tool room and keep his tools well cleaned, bright and housed when not in use, and every thing in working order.

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ESSAY ON CIDER AND CIDER VINEGAR.

BY W. H. RAGAN.

The good old days of sound, perfect apples—such as we could take to our cellars or to market, almost as they came from the orchard, without assorting, has passed away, and we of the West, who raise apples, find ourselves the possessors of a large amount of imperfect fruit. These difficulties seem to multiply annually. So much so that it now becomes a serious question, in the absence of any known remedy for such troubles, as to what way we can dispose of this almost worthless fruit, so that apple orchards may be made profitable.

Without stopping to discuss the very important question of the causes of failure with the apple crop; only intimating our opinion that it is mainly due to insect depredation, climatic influences and changes, and the exhaustion of our soils by a bad system of culture, we will proceed to give our plan of handling and disposing of such crops as we have. Formerly, when unsound fruit was the exception, and not the rule, we looked to the greatest interest in handling. We picked all our fruit from a ladder and with great care barreled all but a few of the poorer specimens for market. The "culls" were thrown out, and if our crop was large, giving us plenty of employment in the handling of the good fruit, were left to rot in the orchard.

Now if we pursue that same careful mode of handling and packing for market, that we have been taught, both by precept and the practical results of marketing fruits, to practice, our pile of "culls" assumes mighty proportions—there is too much of our crop there to lose. We have therefore been compelled to change our "tactics," and instead of that slow and careful mode of handling, formerly practiced, we now go to our orchard when the fruit is ready for harvesting and in the most rapid manner consistent with the interest at stake, we hurry our whole crop "en masse" into barns, sheds, and well ventilated buildings, where, during bad weather and evenings,

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we assort and barrel for market all the very best specimens, throwing out any entirely worthless and rotten fruit, and laying back the "culls." The advantages of this mode of handling are: dispatch in gathering; and the economizing of bad weather and evenings in assorting under cover. Bruises will show themselves after laying a few days and may be rejected in assorting, while apples exposed to a dry atmosphere will bear packing and transportation better by having shriveled somewhat, and they will keep better as they will have gone through the sweat before barreling. Having now disposed of the good fruit, we shall turn our attention to the "culls," which all this time have been snugly housed, undergoing the ripening process, and the evaporation of a great deal of the more watery elements so deleterious to the production of good cider. The weather is also becoming cooler so that cider will keep sweet much longer, besides those who make late always get the best prices for their cider. We now leave this branch of the subject for a while and turn our attention to that of suitable

MACHINERY FOR THE MANUFACTURE OF CIDER.

This is by no means an unimportant branch of the subject; an opinion on which I fear but little controversy, especially from those of much experience in cider making. True there has been much inventive talent employed in an effort to improve our facilities for cider making; but, unfortunately, almost all of this has been expended in an effort to give us a "toy" in the shape of a cider mill and press, to be operated by hand, and greatly at the expense of time, muscle, material and good cider. The result has been to put in the hands of almost every farmer a cider mill and press, upon which he annually expends enough time, labor and apples to buy all the cider that he gets, besides that little is "always" of poor quality. I say of poor quality, because it is utterly "impossible" to make good cider in such small quantities. And yet when I have said all this, I cheerfully admit that these little mills are very useful and handy in making small quantities of sweet cider for immediate use, but entirely unfit for "business." Having thus expressed my opinion of hand-mills, it will be expected that I should offer some better plan of manufacture, which I propose to do, after saying that cider making is really as much the business of manufactories, as grinding our grain or spinning our wool is, and that

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individuals, unless it be large orchardists, are as little able to do themselves "justice" in one case as the other.

There are several of these manufactories in the State of Indiana, and wherever they have been established the hand-mills are laid aside. If a man can, with a good deal of physical exertion, get two gallons of cider to the bushel, when, by hauling his apples a short distance, and without further labor, he could get four gallons of better cider, he would certainly soon learn to prefer the latter. We have known men to bring apples to the mill to be worked, who had to borrow barrels to take their cider home in, when they thought they had brought enough to hold more than they expected to get.

The mill, which we regard as the cheapest, taken altogether, is the Grater mill, consisting of a wooden cylinder, about ten inches in diameter, and the same length, driven full of small spikes (large heel tacks) and driven by one or two horses, and an endless chain horse-power. We prefer the endless chain power, on account of its occupying so little room. The Jersey Grinder is an excellent mill, operating essentially on the same principle as the above, but has the objection of being made of iron, which, unless kept strictly clean, is objectionable, as the acid of the apples will corrode the metal; and it is too expensive for most of us. The wooden mills of "a' lang syne," though working on the true principle of mashing instead of cutting, are too slow and cumbersome for this fast age of ours.

The pressing is, however, the slow, tedious part of the operation, to the improvement of which we wish to call the attention of inventors. The lever has very grevious objections, while, at the same time, it is decidedly the cheapest power, and gives us a continued pressure, even "while we sleep." But when we consider the great labor and inconvenience of operating it, together with the amount of roof to cover it, or the inconvenience of working out of doors, we must give our preference to the screw.

The screw, if manipulated in the ordinary way by the use of a lever, is also quite inconvenient. We shall, therefore, look with some interest to the further developments of a plan proposed by one of Indiana's fruit growers by which these objections to the screw are likely to be overcome. In the use of either power, we would prepare our "pomace" for pressing in cloths instead of straw, or a crib. They are much cheaper, nicer and lighter to handle than either straw or crib.

Our experience leads us to condemn the use of large "cheeses" as

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not economical. A press that will make from one to two barrels at a time, will perform its work quicker and more thoroughly than a larger one that requires greater power and time. I am familiar with an instance of two hands on a one-barrel press having made twenty-five barrels in one day, while a neighbor with a press making fourteen barrels at one operation could only make one pressing in a day, it requiring that time to run dry.

We return now, after the weather has become quite cool, and our apples well prepared by sufficient time in a dry room to the apple-house, where we give our fruit another careful assorting, throwing out all that are in the least degree rotten, with all foreign substances, such as leaves, sticks, stones, and dirt of any kind. They are now conveyed to the mill, which is suspended over a large vat that will hold enough for six or eight barrels of cider and ground, allowing the pulp to lay in the vat for twelve, twenty-four, or in cool weather, thirty-six hours. It will be well if the mass is turned occasionally with a shovel to bring each particle in contact with the atmosphere. This is a point to which I wish to call especial attention and the chief reason why hand mills fail to make good cider, or a good yield. To the chemist we need not explain, but for less educated practical men we would say that there is a chemical action going on from the time the mill finishes its work, which is converting starch and gum into sugar, and at the same time softening the particles of pulp, the result of which is to give us more, clearer and sweeter cider. In order to make this matter so clear that all may understand, I need only to refer my readers back to their "days of childhood," when we were accustomed to thoroughly bruise a sour seedling apple and lay it aside for a time, when on the application of our teeth with a little suction we were able to extract a sweet and delicious juice. Here were at work the same chemical agents that we now employ to our great advantage. Of course we will exercise our judgment in regard to the time we allow the pomace to lay, regulated altogether by the atmospheric temperature. The press should stand near enough to the vat for the pomace to be shoveled over without making it necessary for the operator to change his position, and every other point where a "step" can be saved should be taken advantage of. Every part of the mill and press should be kept scrupulously clean, and the cider, after it runs from the press, should be filtered through a series of cloths, into new barrels, or those recently emptied of pure distilled liquors, or wines. No old, second-hand, musty barrels, of any kind, should ever be used, not even if

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a customer brings such to you to be filled for his own use. He may invite some friend to drink some of your make of cider, which will be discussed, with reference to your reputation as a cider maker.

Cider made in this way, late in the season, from sound, well ripened apples, and put up in new barrels, will keep all winter without further trouble; but if it is desirable to bottle, it will be best to draw it off into clean barrels after it has been made about one month, and again early in March. About three weeks after this second racking, and before the blooming season of the apple tree, it may be bottled, after which it will be treated as wine, for which with most people, it will be accepted as a substitute, and, in the opinion of the writer, is far better. There are certain varieties of apples that are justly celebrated for making cider of extra good qualities; but, with us, it is scarcely necessary to plant such with that view alone, as our common sorts afford all we want, that are fit for nothing else.

I have, thus far, spoken of the manufacture of cider, and considered it in the light of a beverage and as a means of utilizing our waste fruit.

The great profit however, to orchardists, is in its conversion to vinegar; and it has been mainly with this fact before me that I have written the above directions for cider making, since that is the first step in the operation of the manufacture of vinegar.

In the Hygienic economy of the human family it seems to be absolutely necessary that we, or at least those of us who are so situated, that our daily supply of acid fruits is limited, or scanty, should be supplied in the form of acetic acid, which is found in its purest and most healthy and palatable conditions in cider vinegar.

In evidence of this fact I need only refer to the ten thousand ways of counterfeiting "pure cider vinegar." I should almost feel warranted in offering a liberal reward for a single cask in the hands of any dealer in "city or town" that is not pure cider vinegar. They never deal in any other sort. Yet it is a fact, patent to all well informed orchardists, that there is but a very small per cent. of cider vinegar offered to the public through our dealers. That these compounds are injurious to, rather than the promoters of health, is undoubted, while it is equally true that our orchards are capable of supplying all reasonable demands with the pure article. We ask then why this demand is not supplied from our orchards?

There are two reasons; the main one, that consumers will buy these poisonous compounds, when they cost them a little less than

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the genuine; and that it requires a good deal of patience, time and perseverance to get up the pure article. When we can take a little alcohol, sorghum scum, acetic acid and rainwater, and run it through a generator in one day's time and bring it out "pure cider vinegar," and get as much for it as a barrel that has taken from one to two years to "come," we see that the premium for honesty is small.

But how to make pure cider vinegar is the question? This can only be done by taking such cider as we describe above, putting it in a cask with an open bung, and setting it away in a dry warm room where it will not freeze, awaiting the result, which will come about, in from one to three years. The formation of acetic acid, or the process of acetic fermentation, may be hastened by using casks that have been used for vinegar, or by adding sour cider to a cask already one-third or one-half full of vinegar. But to attempt anything further than this, in the way of hurrying matters, is always at the expense of quality.

Our object in writing this essay has been more to encourage the orchardist in the utilizing of his waste fruit, in a way that it may not only be a source of profit to himself, but so as to offer to the consumer, instead of an article injurious to human life and health, one that shall be the promoter thereof; rather than to attempt anything in the way of scientific descriptions, of processes and manipulations connected with the manufacture; in other words, to present the matter in its most practical form—in plain "English"—so that he who reads may not fail to understand.

For the above reasons, the scientific reader may object to this paper as not giving the "details" sufficient attention.

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THE MANUFACTURE OF CIDER AND CIDER VINEGAR.

BY W. H. WHITE, SOUTH WINDSOR, CONN.

Cider is a product of apples, as wine is of grapes; each is the pure expressed juice of the fruit, and each must pass the vinous fermentation, in order to give them the peculiar boquet and freshness of taste so agreeable in either.

The expressed juice of the apple soon commences a natural fermentation when exposed to the air at a moderate temperature, the warmer the sooner, and more violent the fermentation, which after passing to a particular stage, ceases, or nearly so. It is now in the state familiarly known as cider; and, in this state, under favorable circumstances, it may be kept an indefinite length of time; change those circumstances, and there is a new fermentation commenced, known as the acetic, which is kept up for many months. This is a slow process to completion, under natural or ordinary circumstances, when we have a different product known as vinegar; cider vinegar! No known fruit, or other produce, will produce vinegar equal, for all its varied uses, to cider vinegar, yet but a portion only of the vinegar of commerce is the product from apple cider.

During the process of the acetic fermentation, there is a natural product formed in the liquid, known as the vinegar plant, mother of vinegar. Without any addition to the cider, this fungus growth originates and produces itself, from elements in the cider to a limited extent, sufficient for all purposes; and this is found in all really good and pure cider vinegar. The purity and goodness of this plant depends largely on the cider from which the vinegar is produced. The length of time vinegar will preserve its life and goodness, depends upon outside circumstances. It may be continued in the same cask as long as the cask will endure; and this I have found the best way to preserve and keep vinegar generally. After once being produced, draw out vinegar and fill in good sour cider, a little at a time, at most only a few gallons to each barrel, and at intervals

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of some weeks each. Thus treated, and all dust, dirt, etc., kept excluded, there is no limit known to its keeping good. Unless kept pure and thus renewed with good old sour cider, there is a last process gone through, known as the putrefactive fermentation, when your vinegar is no longer vinegar, and only fit to throw on the compost heap.

Cider will only keep good, without going into the acetic fermentation, when it is the pure juice of the apple, and the air is excluded from it. If there are particles of the fruit, or the fruit has commenced to change to any considerable extent, in any way, the goodness of the cider is impaired. So, also, if the juice has any foreign matter introduced during, or after the process of extraction, it is quite apt to impair both the cider and the vinegar made from it. A product so sensitive to foreign matter and outside influences would seem, therefore, to require great nicety in all its processes of production; yet often ordinary skill and care will outdo the most exquisite skill and manipulations of the educated amateur. Without attempting to theorize on the why or wherefore of this difference, I will proceed to give practical directions for making good cider, and when good cider is obtained, how it may be kept so, or be made into cider vinegar, each of which shall be of the best quality; and all derived from experience, and observation of first class producers. And first as to

FRUIT.

For reasons intimated above, none but good fruit should be used; knotty or gnarly fruit is no objection to it, but rather in its favor, as the rind of the apple gives us its best product, and the more uneven the surface, the more there is of it. All sound fruit is the best, but practically, there is no objection to a small proportion of specked, if the decay is not of the black or mouldy rot kind. Clean apples, without dirt or leaves, must be had, or leaves, etc., will give an unpleasant flavor and have a deleterous influence on the cider in several ways. The apples should be well ripened, be gathered and lie in a pile, covered three or four days to sweat a little; not to heat; before being ground or mashed. The best cider is made from the latest ripening apples, and after cold weather comes on. We next notice

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THE MILL AND PRESS.

There have been inventions introduced for pulping apples, or grinding, which greatly facilitate the object; yet, so far as experience goes, the cider product does not equal that produced in the older way; the reason of which, in part, is, the apples are grated so fine in an iron mill as to crush the seeds; and then there are other metals with which the apples, juice or pomace, come in contact, all exerting a deleterious influence on the cider. No metal of any kind should be used in the mill or press anywhere, to come in contact with the pomace or juice. A wood mill is, therefore, the best; and for crushing the apples, corrugated or fluted wood cylinders, running loose enough not to crush the seeds, yet to well crush the apple, with a sufficient bed or trough or plank to hold the pomace for a medium sized "cheese." The pulp should lie in the trough long enough to mull somewhat, two to four or more hours, before being put to press.

The bed of the press is best of oak or chestnut plank, five to six feet square, with grooved or raised edges, and a little inclined to one side, with a suitable lip to shed the juice freely, and leading the juice into a suitable vat. Further description of the press is unnecessary, except to say that the follower consists of a suitable number of oak plank, one and a half or two inches thick, to cover the top of the cheese when laid up. Have a narrow board or gauge, four inches wide and length of press square. Provide a quantity of clean, bright straw, rye is the best; cut it in two equal lengths; a wood-scoop shovel for shoveling the pomace, etc., and a piece of board fitted for spreading and leveling the pomace, and you have all in readiness to begin to lay up the cheese, provided you have washed off the press, vat, and other appliances, and made all clean and sweet. Shovel on to the bed of the press, pomace, take your strike gauge and set it on edge near one side, and level up the pomace to its top; go around the four sides in the same way; fill up and level off the center a little rounding. Now take your cut straw and spread it on thinly, letting it lie straight, and the outer ends projecting about two inches on all four sides; scatter a little over the middle, and proceed to lay on more pomace, to be formed into another cake. In like manner continue till the press is full; lay on your last coat of straw on top, and then place the follower on the top of the whole; on this place the blocking, and turn down the

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screws, gently, being in no hurry; see that the pomace does not squash out, and that the cheese comes down level and square.

The middle running of the cheese makes the best and clearest cider, and this should be saved by itself for bottling and drinking; the other will make a second quality, suitable for making into vinegar, etc. The straw answers the double purpose of binding and holding the cheese together, and facilitates the extraction of the juice. After gently pressing four to six hours, gradually increasing the pressure to the last, run up the screws and cut off two to four inches of the outside of the cheese all around, break it up and lay on top; put on your follower, and again apply pressure as long as the juice continues to flow, when the cheese may again be cut down and again pressed, if thought economical. All this time the expressed juice should be dipped from the vat, strained through clean straw and flannel, in a funnel, into casks, and each running kept separate. The straw and flannel filter strainer will clear the juice of all particles of pomace and other impurities. The barrels or casks should be of oak or chestnut, perfectly clean and sweet; good spirit casks lately emptied make good casks for cider. As soon as may be, the filled casks should be removed to a cool cellar, all designed for drinking purposes, etc.; that for vinegar may be stored in any secure, proper place, and set on skids to raise the casks six or eight inches from the ground, have the bungs removed, and not be disturbed. Impurities will work off at the bung; the cask should be kept full by filling in more juice as it is thrown off. As soon as the most violent fermentation is over, insert a bung with a bent tube, syphon shape, placing the open end in a cup of water, which will allow the fermentation to go on and yet exclude the air. When the ferment shows only an occasional bubble escaping through the tube in the water, remove, and bung up air tight. The next spring—March or April—draw off and bottle, and you have cider that will keep any reasonable time, and when opened will snap and sparkle, and be preferable to any champaigne we find in these days, unless made in the same way. The cider may be kept without bottling in the casks, if they are kept perfectly air-tight; but when you have drawn from it awhile it will change, as the oxygen of air unites with the cider, forming an acid. The great secret in keeping cider pleasant consists, first, in making it from sound good-flavored fruit; second, in thoroughly filtering it of all particles of pomace and other impurities; third, having it free from any foreign agencies in contaminating the juice previous to putting it in clean, sweet,

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strong casks, and letting it ferment to a proper stage with as little air coming in contact with it as possible; fourth, storing in a cool cellar of even temperature, and keeping the vessels in which it is placed perfectly air-tight, for cider changes fast when air is allowed in contact with it; for this reason we prefer not to rack off from one cask to another—only to draw off when to be bottled, etc., and if properly filtered at first, there is no need of its being racked off, as the fermentation will throw off any remaining impurities needful to be thrown off.

VINEGAR MAKING.

Good bodied cider will make the best vinegar soonest; yet second quality and early made cider, from fruit that is not fully ripe, will make fair vinegar, and this is the more frequently used in making vinegar. To make good strong vinegar that will retain its goodness longest requires that the cider from which it is made be free from matter that will pass to the putrefactive ferment; as particles of fruit, dirt, etc., remaining in the cider will after a while cause this putrefaction to begin, and when once begun it is often over before we are aware of it. Cider made and filtered as above directed will be very little liable to any such objection—practically none.

The making of the best vinegar is a natural and slow process, requiring from eighteen months to three or four years; yet there are processes, patented and otherwise, which materially shorten this process, but the product is of an inferior quality. I will first give the best way, as I conceive it to be, and then give some of the quicker processes. For the production of good vinegar, nothing more is needed than to place the casks about two-thirds full of cider, and see that they are kept about so full, by filling from one kept for that purpose, as it is evaporated, in any building which will protect them from wet and dampness, and leave the bungs out so that air may reach the cider, and it evaporate and sour, as it will, if left to itself. Remember that *absolutely nothing* is to be added to the crude material, and no racking or manipulation, of any description, is required or allowed. Chestnut casks are the best for making and keeping vinegar in, as it will keep better in such than in any I ever tried of other wood. The casks for making the vinegar in, may be either barrels, or of any other capacity, only observing the above conditions. Any number of casks may be stored in the same building, the only provisions being that there may be access to each for examination and filling

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in, as occasion requires, and that they be kept from outside dampness, etc. To obtain a satisfactory article of vinegar that will retail for sixty to seventy-five cents per gallon, requires, in this mode, three to four years, but, when once made, it may be renewed to the amount of one-third, to one-half or more, each season, by drawing out and filling in with what has less age. This is the only natural way of making vinegar, and the only way to be recommended; yet we are not all suited to await the operations of nature in thus providing the purest and best, and seek out other inventions.

Many secret recipes for the quick making of vinegar from various liquids and substances, are hawked about the country, all founded on the principle of exposure of the liquid to the air, while that absorbs oxygen from the air, and thus creates an acid. The principle must contain alcohol, or that which may be converted into alcohol, and this it is which by the absorption of air is converted into acetic acid. All these chemical changes are familiar to the student in chemical science, so that it is not needful to here notice them further. The most common way of exposing to the air for vinegar making, is to trickle the fluid over beech wood shavings, and keeping a specified temperature of the fluid and air, admitting the air freely. The vat or cask is set on one with a platform or partition, six or eight inches below the top, perforated with small, smooth holes, with pieces of twine drawn through. Below this partition the vat is filled with shavings, and the vat has numerous holes through the sides to admit air, and the vinegar is drawn off at the bottom. Over this vat is the fountain from which the fluid is admitted into the top partition of the vat, some air escape-pipes being inserted in the platform and coming up to a level of the top; the liquid, in trickling through the holes in the platform over the strings, and then over the shavings, exposes a large surface to the action of the air, and the inside temperature is regulated and governed by a thermometer. If once running through does not give a sufficient acid, it is put through again, to be repeated if necessary.

Additions are sometimes made to the cider, such as smearing a piece of brown paper with molasses, and putting in the cask, besides various other resorts, none of which are to be commended where a good and pure article is desired.

Recollect, that neatness and protection from dust, dirt, etc., in the manufacture of vinegar is as essential in all the manipulations, from the gathering of the apples to the final product, as in the proper production of butter or cheese in the dairy.

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EXECUTIVE SESSION.

At a meeting of the Executive Board, held February, 28, 1871, the following orders were passed:

That this Society hold, in conjunction with the Marion County Horticultural Society, an exhibition of small fruits, flowers, etc., in the city of Indianapolis, in June—the time to be fixed by the latter society—the State Society donating $200 for the purpose of paying premiums.

That this Society illustrate its forthcoming volume of transactions with a frontispiece, to be a portrait of our very worthy Ex-President, I. D. G. Nelson.

The State Board of Agriculture made the usual allowance of $800, to be paid in premiums at the State Fair this fall, in the Horticultural Department; also, giving this Society the privilege of arranging the Premium List, and managing the exhibition; and, in addition, allowing us $200 for the purpose of holding a June exhibition, as above indicated.

For such favors this Society is under great obligations, and hope to so perform its trust as to merit further favors.

The business of the session being finished, the Board then adjourned to meet, during the June meeting, in Indianapolis.

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NOTES AND GLEANINGS

BY THE

CORRESPONDING SECRETARY.

We last year collected a few items under the above caption, which seem to have been regarded with some favor by some members of our Society, who have suggested the propriety of my again looking up something of the kind for the appendix of our forthcoming volume of transactions.

In complying with said request I do not think I can do better than to offer the following, which is a part of an essay on the apple, by T. McWhorter, of Millersburg, Illinois, read before the Illinois Horticultural Society, at their annual meeting in 1868. Mr. McWhorter is one of Illinois' best posted and most thoroughly practicable men, and having had some experience with "Low Heads" speaks as follows:

LOW HEADS.

Well, how low? In what form have the head branch out &c.? On such points, the man who has experience only with young orchards, will hold different ideas from one who is dealing with trees that have attained age. The low tree will certainly make a large top more rapidly, and bear fruit sooner, than if the sap from the roots had to pass up through the sap-vessels of a long trunk. It will also stand the winter better. But in an old orchard, when trees have attained broad proportions, it becomes difficult to cultivate and get about under the trees when the top starts out at the ground.

The question for the orchardist is, how to secure the advantages of low heads, and obviate the difficulties that arise, as trees attain age.

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We accomplish this only by a judicious system of pruning. First we would allow the tree to branch low, but as far as practical, we would encourage a central stem, of a predominant growth. We would prefer not to have the entire top of the tree branch from a low point. If some of the side branches incline to become too strong so as to rival the central stem, let them be checked by shortening back. If the central stem takes too strong growth, then it should be checked by cutting back, to encourage the growth of the side branches.

With this form of top, we may have all the advantages of low heads in our young orchards, and as trees attain age and broader proportions, the lower branches, as they become troublesome, may gradually be removed and no injury is done to the health or form of the tree.

PRUNING.

Injudicious pruning is not among the least of the evils in the way of successful orchard culture. On the subject of pruning we have doubtless much to learn. A very common error in young orchards, is that of cutting out all the small branches in the center of the tree—it is the small center branches that give us the first crops of fruit. It has even become a question among some of our best Horticulturists, whether the universal practice of pruning out the center of old orchard trees is not an error. It is argued that the trees should not be allowed to extend their tops to such broad proportions, with such a great amount of waste room in the center of the tree without either fruit or foliage. That instead of trimming out the centers, we should shorten back the extending branches occasionally; thus keeping the top in closer limits, and encouraging a fresh growth of fruit-bearing wood on the outside of the top. It can not be claimed that this theory of management has yet been sufficiently tested to justify its recommendation for general practice. But at least, we may do by it as by some of our apples—recommend it for *further trial.*

ROOT GRAFTED OR STOCK GRAFTED TREES.

On this subject we have at times had some random discussion but it can hardly be said that it has received a critical consideration. It is claimed that stock grafted trees are more productive; the only foundation for such a theory being a dissimilarity between stock

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and graft. The stock is merely the conductor through which the crude sap passes from the root to the branches. And, it is true that a dissimilarity between stock and graft often retards circulation; and whatever retards circulation, favors the formation of fruit buds. But, in our stock grafted apple trees, there being no specific dissimilarity, (as between pear and quince) no very marked results should be expected. Nevertheless, it must be granted, there does exist some degree of dissimilarity in the woody fibre of different varieties; and it can not be doubted that this slight degree of dissimilarity, in some cases retards circulation. Hence, it is but a legitimate conclusion that the stock grafted tree may, in some cases, be more productive. But if there is a dissimilarity between stock and graft, there must also exist a like dissimilarity among the different varieties we cultivate; and from this reason alone, no uniform advantage can be derived from stock grafting as a general practice. Then again, there is also a like dissimilarity between seedling stocks—in a lot of seedlings no two are alike, and there must be a corresponding variation in the effects. Thus we see the advantages of stock grafting as a practice, is rendered still more complicated and uncertain.

But still, we can admit the probability that some of our cultivated varieties may be so peculiarly distinct in woody fibre, that, as a general rule, when grafted or budded on other stocks, the circulation may be more or less retarded, and hence, result in a greater tendency to productiveness.

Thus the conclusions to which we arrive are, 1st, That the only advantages that can result from stock grafting, must be from a dissimilarity of stock; 2d, That no uniform advantage can be affected, except by using a uniform kind of stocks with each variety we so cultivate. Hence, if we would give this subject a fair trial, let our shy bearers be tried on different varieties of root grafted stocks. Let us have experiments that will lead to different results.

OUR SELECT LISTS OF APPLES.

How shall we expect improvement? It can not be supposed we have yet arrived at the ultimate of improvement. True, we can get up a list for *Autumn*, and for *Early* and *Mid-Winter* with which we are tolerably well suited. But we would like some improvement in our *Early Summer* apples. We would like something as early as Early Harvest, on such a *tree* as Ben Davis, and as good in quality and as productive as the Benoni. And we are far from being suited

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with our list of *Keepers.* Can we name a single keeper that is free from objections? Janet and Winesap are *too small;* White Winter Pearmain *scabs;* Ben Davis has every qualification *except quality;* Willow Twig is only a *good cooking apple,* and so on through the list. We want an apple equal to Yellow Bellflower or Roman Stem in quality, with the productiveness and keeping qualities of the Willow Twig.

For improvement in our list of Keepers, let us experiment with Southern apples. We hardly need expect that a Northern climate will originate a good keeper, adapted to the wants of the Valley of the Mississippi. Where the seasons are short, nature produces fruit, having a short period from the blossom to the maturity of the fruit. Northern apples generally drop too early for our long Autums; as examples, take the Roxbury Russet, Rhode Island Greening, Baldwin and Jonathan. Our longest keepers have a more southern origin, such as Janet, Willow Twig, Winesap, and Limber Twig. Let us test the Southern apples.

I will close this article with a few reflections on the subject of *Insect Depredations.* It is certainly not very gratifying to look back over the horticultural investigations of fifty years, and see how little has yet been accomplished by man in checking insect depredations. It seems that all the means that we can employ in the destruction of insect life must have such a very limited application that, in the aggregate, very little has been accomplished to abate the evils.

It is not my purpose to dissuade people from continued efforts, but from *needless alarm.* While we feel that we have not accomplished much ourselves, we can fall back on a very consoling reflection.

It seems a universal rule in nature that whatever species has the most rapid means of increase, nature has also provided the most formidable means to diminish their numbers and check their overspread. In all animate nature there is *conflict.* Insect life not only preys upon the vegetable, but also upon each other. Scarcely a species exists that has not one or more parasitic enemy. Insects generally have a rapid means of increase, and will exist in proportion as conditions favor their existence. And we can easily understand that the prevalence of any one species will afford a means for the subsistence of their parasitic enemies. In other words, the *carnivorous* insects will spread in proportion to the insects on which they subsist. When the Potato Bug prevails then the Lady Bug

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can flourish and feast on the eggs of the former. Where the Bark Louse has become spread, its little enemy, the Mite, finds means to subsist. Then we have extreme atmospheric changes with the changing seasons: all the changes of the elements favor or check in some way the spread of insect existence. While we are devising means to work on a small scale, nature often sweeps away the pest in a single season.

Eli Daggy of Tuscola, Ills., ventilates "humbugs" as follows, in an essay read at the late Illinois Central Horticultural Meeting, at Carlinville. Horticulture is a branch of industry in which "humbuggery" succeeds to an extent only equaled in the "healing art"—each giving ample *time* and opportunity for the perpetrator to make his escape before the facts of a *swindle* are fully developed; and while we, as a class, claim to be *progressive*, at the same time it is clearly our duty to discourage, by all honorable means, the purchase by our people of *all new* horticultural wonders that are offered by *traveling agents* with their colored plates and preserved specimens.

HORTICULTURAL HUMBUGS.

"There is cheating in all trades but ours," is an old adage that has gained the position of a jest in proverbial sayings in these days. We admit its fallacy.

The good, honest(?) old farmer goes to market with his products, exhibiting the best specimens of corn, cabbage, or potatoes on the top of his load, and sells by the samples in sight.

The merchant in return sells the best goods in the market at the lowest price, and warrants them, weight and colors, with great confidence, when he has not the most remote thought of their ever being brought to the test.

The physician visits the bedside of his patient with more airs of wisdom than necessary, to make the disguise complete, and administers what he supposes will satisfy the credulity of his patient, and hopes no further attention will be necessary, or promises to call again, according to the prospect of the early settlement of the bill.

The mechanic is able to point out defects in the work done by his rival; while his own exhibits that beauty, taste, symmetry and

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judgment, and even perfection, which none but the eye of a master of his trade could discover.

The trader, when buying, has an eye to see defects that the owner of the proffered article has never discovered; but, as soon as the bargain is closed, the critic's eye is suddenly transformed into one of admiration, and the perfectly faultless article is offered for sale at a fancy price because of its perfection.

The teacher becomes the sovereign in his little domain, rather than the instructor, because he holds a position in which he can abuse the credulity of his untutored pupil.

The lawyer claims to dispense justice, yet will defend his client against justice, to exhibit his professional genius, and receive a liberal, if not an unscrupulous compensation.

The minister, too, in that most sacred of all callings, is sometimes inclined to seek the eulogies of his flock, rather than souls, by the simple story of the cross.

Daily observation teaches us these lessons; yet we are happy to be able to note honorable exceptions that adorn the various avocations of life, and tend to exhibit the false in their true light by way of contrast. How could we detect error and falsehood except in contrast with truth? or, deception and fraud by comparison with honesty and integrity? Or how can we fix the standard of virtue but in contrast with vice?

But I am to consider briefly some of the deceptions and frauds practiced in the art of Horticulture.

These are too numerous to receive anything but a passing notice in this short essay.

The nurseryman is almost compelled to humbug some customers, or they leave him dissatisfied.

I have only to refer to the great demand for large trees with which every one is familiar—and attempting to convince such men of their error is simply time and labor lost. Any worthless sort of trees can be sold at high prices if they are only large enough.

In the selection of varieties, the planter is frequently governed by some recollection of the past, and, without the least thought of adaptation to soil and climate, cumbers his ground with something as poorly adapted to his locality as ducks would be to perch on trees, or turkeys to take to the water.

It is worse than nonsense to buy and plant, generally, all articles that are catalogued and recommended by growers and dealers in trees and plants. Tree peddlers take the most liberal view of the

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situation by agreeing to furnish every customer just what he wants in his particular locality. Labels and names are cheap, and they can easily afford to make any change that can be made to satisfy the most fastidious customer.

If need be, they can also give all necessary instructions for the planting, pruning, culture, and future care of trees or plants with as much assurance as if they knew what they were talking about.

But the tree peddler is not the only sinner in this department.

There are long lists of trees and plants in the catalogues of growers, many of which have no intrinsic value whatever, but only serve to keep up the general system of humbugging the ignorant and unsuspecting.

I might name such specimens as the *VanBuren's Golden Dwarf* Peach, "Crystal White" and "Newman's Thornless" Blackberries, "Marvel of Four Seasons" Raspberry, and "Mexican Everbearing" Strawbery—which, I fear, have but little merit in any soil or climate.

Many agricultural and horticultural papers also give aid in this direction by advertising and puffing everything for which they can get pay, and thus, instead of a blessing to the rural population for whom they are intended, they serve as a medium for practicing deception and fraud.

Here, too, I must say we have honorable exceptions.

Grape culture is now assuming a character in this country that our Horticultural Societies can not much longer afford to fellowship.

Vine-growers take the position that they are doing just the right thing to banish intemperance from our midst by changing the character of the beverage to the mild one produced from the grape that will not intoxicate.

I think it safe to say, however, that no one takes this position except those whose thirst for drink induces them to take a charitable view of the subject, or those whose pockets are expecting to receive the pecuniary benefits arising from this increasing trade.

It is not my province at present to discuss this question, but simply to notice the fact that quite an attempt is made to give wine-making a *horticultural* garb, and in this way put on an air of respectability by introducing it into good society.

Now, I hope to be understood on this point to mean that it is not wine for useful or necessary purposes that I condemn, but the abuse; or, in other words, the preposterous idea that making wine a common

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beverage—furnishing an abundance of cheap drink to stop drunkenness.

I don't think it possible that even the ennobling and refining art of horticulture can give character and respectability to a humbug so preposterous.

As one of the humblest of horticulturists, I am quite anxious to relinquish all my claims to any of the credit for producing the kind of reformation proposed by the wine-growing reformers. It is as absurd as to undertake to starve a man by increasing his stock of provisions.

I hope our Horticultural Societies will shake off this reptile that is fastening itself upon them, ere it becomes a beast of prey and devours them.

I can only allude to the many devices prepared for packing, and the deceptive manner in which fruits are packed for market for the purpose of fascinating the purchasers.

I am aware that long, tedious essays are justly under par in our horticultural meetings, and, lest mine should become so, I close.

An imporant question with tree-planters is to know when to plant to obtain the best results? The writer of the following has made some very careful experiments resulting in favor of *Fall Planting*, and although written for a daily paper, we take the liberty of copying, hoping to benefit some who may thus have the results of other's experiments and experience:

FALL AND SPRING PLANTING.

I refer especially to the transplanting of deciduous trees, shrubs, and vines, where I claim many advantages for fall over spring planting. There are likewise a few reasons in favor of spring planting. Since, therefore, this is a very important question (that of planting), and one involving the prosperity and success of our efforts at fruit-growing, I will attempt to give both sides a fair showing, which will at least call the attention of the planter to the fact that he has a duty to perform, whether planting in spring or fall.

If we defer our planting until spring, we feel that any less that

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may occur from cold winter, rabbits, mice, or other causes, is at the expense of the nurseryman; but these risks have to be taken by the planter after the first winter. We are, also, often hurried by fall work, and are too willing to put off doing a thing that can be deferred, so we don't prepare our ground in the fall; but when spring comes we have no option in the matter, and if planting is done at all, it is often done without thorough preparation, and even then when the ground is too wet to work, even to the extent of digging holes.

Spring work presses us, the roads and weather are bad, and the nursery at some distance, so we defer from day to day to go and get our trees. Meanwhile, nature is not idle, but day by day the warm sun and balmy breezes of spring are warming into action the dormant energies of the tree. Little rootlets are reaching forward in the warm soil after nourishment, buds are developing, and, in short, the tree is awake, its winter's sleep is over, and now we go—perhaps a hot, dry day—to the nursery and select our trees. Others have deferred going from the same reasons we have, and now all crowd in at once, and so hurry the nurseryman—not always too careful—that he digs the trees badly and packs them poorly, and after a protracted railroad transit, they are hurried in by the planter in order that he may the sooner give his attention to some other pressing work. The drying process that his tree is exposed to is sufficient to undo all the work that nature had already done, and now, at an advanced stage of the season—perhaps to be followed by an immediate drouth—it has to make a new start, if it ever does, which, with the development of a few feeble buds and leaves, finally succumbs to the attack of insects and summer drouths.

This is not the result of all spring planting, for if trees are early and well planted in spring, I am not sure that there is much greater loss than from fall planting; but we have seen that the chances are that such will not be the case. Now, we will suppose that the tree is planted in the fall, and even done in a careless manner, the dirt thrown in in coarse lumps about the roots, the action of frost and rains of winter is sufficient to settle the earth firmly about its roots, and when the first latent energy is developed by the approach of spring, it goes to work no more to be disturbed, and is so well and thoroughly fortified against the approaching drouths of summer, that they have but little effect on it.

Fall is also a more leisure time, the roads and weather are better,

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and the chances are that both nurseryman and planter will do their work better. There is, however, one precaution that fall planters must take, that is, to raise a mound of clean earth (if there is trash in it, it will harbor mice) ten inches or one foot high around each tree, which should be firmly pressed down with the foot, so as to hold the tree in place from being heaved out by the winter freezing, or blown about by the winds. This also protects the tree somewhat from mice, rabbits, and cold weather. The mound should be removed to a level in the spring. If this operation is performed for several years, it will be of benefit.

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REVISED PREMIUM LIST

OF THE

HORTICULTURAL DEPARTMENT

OF THE

INDIANA STATE FAIR.

SECTION VIII.

FRUIT—AMATEURS' LIST.

RULES.—The Awarding Committee will report a list of the varieties in each collection, to which they award premiums. All fruits must be grown by the exhibitor, and correctly labeled (four of each variety), accompanied by a list of the same for each entry. No collection can compete for more than one premium. No premium shall be awarded to inferior specimens or collections, it being the object not to encourage the exhibition of inferior sorts, having reference to the excellence and value of varieties only.

Nurserymen will not be allowed to compete in this section.

APPLES.

Best twenty-five varieties of apples	$15
Best twenty varieties of apples	10
Best twelve varieties of apples	8
Best six varieties of apples	4
Best fifteen varieties of winter apples	10
Best five varieties of fall apples	5

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PEARS.

Best fifteen varieties of pears in succession	$15
Best ten varieties of autumn pears in succession	10
Best five varieties of winter pears in succession	5

PEACHES.

Best five varieties of peaches	$ 5
Best three varieties of peaches	3
Best one variety of peaches	2

GRAPES GROWN IN OPEN AIR.

Best five varieties of grapes	$5
Best three varieties of grapes	3
Best five clusters of grapes, any kind	3
Best collection of grapes	diploma and 10
Best collection of grapes, grown under glass, of not less than five varieties	10

QUINCES.

Best show of quinces	$ 5

SECTION IX.

PROFESSIONAL LIST.

All persons making it a specialty to raise fruit and flowers for sale, as well as nurserymen and florists, will be considered in the professional list.

Requisites the same as Amateur's List.

APPLES.

Best twenty-five varieties of apples	diploma and $15
Best twenty varieties of apples	diploma and 10
Best twelve varieties of apples	diploma and 8
Best six varieties of apples	diploma and 4
Best fifteen varieties of winter apples	diploma and 10
Best five varieties of fall apples	diploma and 5

PEARS.

Best fifteen varieties of pears in succession	diploma and $10
Best ten varieties of autumn pears	diploma and 10
Best four varieties of winter pears	diploma and 5

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PEACHES.

Best display of peaches, not less than five varieties..... $10

NATIVE GRAPES.

Best collection of grapes..... diploma and $10
Best five varieties of grapes..... diploma and 5
Best three varieties of grapes..... diploma and 3
Best one variety of grapes..... diploma and 2

QUINCES.

Best dozen quinces..... diploma and $ 2

SECTION X.

THE STAR (*) LIST.

This will be a highly interesting feature of the exhibition to all genuine pomologists and those of *educated* taste, as well as to those who wish to become posted in regard to the most profitable fruit to be grown for market, especially the apple, which is destined soon to become one of the staple articles of commerce in Indiana. Persons wishing to compete for these premiums, who are not members of the State Horticultural Society, and who, consequently, have no copy of the Transactions to guide them, as well as others wishing to be informed of the *pomological status* of our State, can obtain a copy and become members of the society by sending one dollar to Dr. A. Furnas, President, at Danville; Seth W. Pearson, Recording Secretary, at Plainfield; or W. H. Ragan, Corresponding Secretary at Indianapolis.

Best five varieties of winter apples, most profitable for commercial purposes, in Northern Indiana..... $ 5
Best five fall and ten winter varieties for family use and for market in Northern Indiana..... 15
Best five varieties of winter apples, most profitable for commercial purposes, in Central Indiana..... 5
Best five fall and ten winter varieties for family use and for market in Central Indiana..... 15
Best five varieties of winter apples, most profitable for commercial purposes, in Southern Indiana..... 5
Best five fall and ten winter varieties for family use and for market in Southern Indiana..... 15

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Best display of apples for the State at large..... $20
Best display of pears for the State at large..... 15
Best display of grapes for the State at large..... 10

Exhibitors in this class will be required to confine their lists to such varieties as have received the commendation of the State Horticultural Society. No fruit can be exhibited for mere show, under the penalty of the exhibitor being ruled out; the object being to test the progress of *pomological science* in our State under the auspices of the Indiana State Horticultural Society; therefore, the awards will be made purely on the intrinsic merits of the fruit, as defined by and published in the Transactions of that Society.

SECTION XI.

SPECIAL PREMIUMS.

Best display of fruits of all kinds from any county, district or local horticultural society..... $30
Second best..... 20
Best aquarium and fixtures..... 10
Second best..... 5
Best collection nursery stock..... 20
Second best..... 10

WINE.

Best display of wine made in Indiana..... $15
Second best..... 10
Best currant wine.....diploma
Best strawberry wine.....diploma
Best raspberry wine.....diploma
Best blackberry wine.....diploma

Grape wine competing for premiums must be made from the pure, unadulterated juice of the grape, otherwise, the committee to make no award.

SECTION XII.

FLOWERS—AMATEUR'S LIST.

Nurserymen and dealers in green-house plants can not compete in this class.

Best collection of green-house plants, not including plants for bedding out..... $15

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Second best	$10
Best collection dahlias	5
Second best	2
Best collection of bedding out plants in bloom—verbenas, petunias, phloxes, etc.	8
Second best	4
Best basket fresh cut flowers	3
Second best	2
Best boquet, round	3
Second best	2
Best boquet, flat	3
Second best	2

PROFESSIONAL LIST.

Exclusively for nurserymen and dealers in green-house plants.

Best collection of green-house plants, not including plants for bedding out	diploma and $15
Best twenty-five varieties of dahlias	diploma and 5
Best collection of bedding out plants in bloom	diploma and 5
Best basket fresh cut flowers	3
Best basket fresh cut roses	3
Best boquet, round	3
Best boquet, flat	3
Best boquet, mantle	3
Best collection camelias	5
Best collection of winter parlor blooming plants	diploma and 5
Best collection variegated leaved plants	5
Best arrangement of plants for exhibition, including quality of plants and taste in arranging the same	15
Best fountain and water jet in operation in floral hall	diploma and 20

SECTION XIII.

JELLIES, PRESERVES, PICKLES, AND CANNED FRUITS.

No article can be entered to compete for more than one premium, except as a part of a "collection" in the same class.

Best collection jellies, made by one exhibitor	$ 5
Second best	3
Best collection preserves	5
Second best	3
Best collection fruit butter	5
Second best	3
Best collection pickles, made by one exhibitor	5
Second best	3

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Best collection dried fruit	$3
Best collection canned fruit, made by one exhibitor	10
Second best	5
Best collection of jellies, preserves, butter, pickles, and canned fruits, by one exhibitor	15
Second best	5
Best fruit ladder	2
Best fruit jar	diploma
Best fruit picker	diploma

Duplicate statements must be furnished, showing the process followed in the manufacture of the articles in this class.

The judges will test the articles, and make a full written report of the result of their investigation.

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ADDENDA.

The following list of members was received too late to go on the regular "roll." Deeming it our duty to publish such, we here insert them:

Mercer Brown, Nurseryman, Kokomo.

W. W. Barnum, Nurseryman, Southport.

A. N. Miller, South Bend.

Mrs. R. G. Vaile, Kokomo.

Stephen Davidson, Rochester.

Wm. Ashton, Rochester.

Robt. Mitchell, Princeton.

Jno. Bird, Nurseryman, Raysville.

Mrs. D. A. Mansfield, Agent Boswell's Fruit Dryer, Indianapolis.

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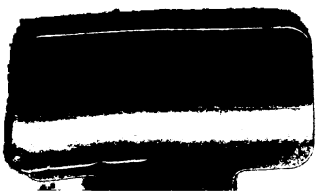

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